A FORTUNE IN EGGS

HOW TO BUILD UP A HEAVY LAYING STRAIN

By L. F. VAN ORSDALE

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How to Build Up a Heavy Laying Strain

A Thorough and Exhaustive Treatise on Egg Production and the Conditions which Govern the Development of a Heavy and Persistent Laying Strain of Fowls.

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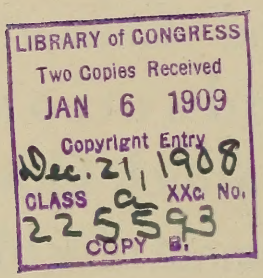
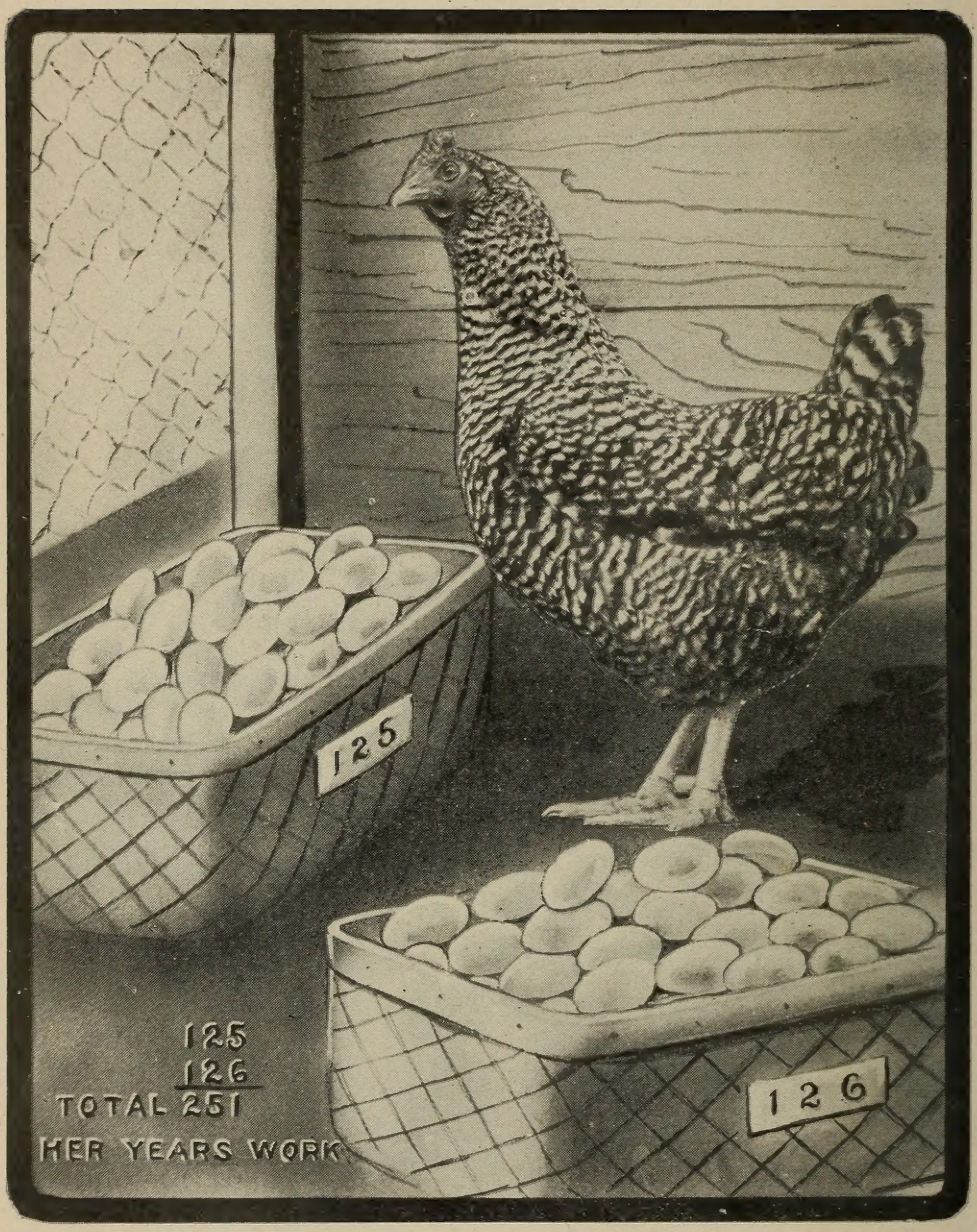




THE CHAMPION EGG PRODUCER.

The Barred Plymouth Rock hen shown in the above illustration, laid by actual count, 251 eggs in one year. An accurate trap nest record was kept so that there would be positive proof of her performance and is an illustration of what can be accomplished along this line.

Introductory

Improvement in all departments of poultry keeping has been so rapid in the last few years, that books on the subject are practically out of date by the time the ink is dry and the methods followed universally as the best, previous to the last decade, are now obsolete.

In presenting this work to the poultry keeping fraternity, the authors have endeavored to set forth in unmistakable terms, the very latest tested principles to be followed in building up and maintaining a healthy and heavy laying strain of standard bred poultry.

The ultimate goal to be reached is the production of the hen with the highest record of even sized salable eggs, improving if possible, on the color and flavor of her flesh and developing her ability as a breeder to reproduce her kind true to type and in satisfactory numbers. Birds with high egg records are being feverishly sought after and the trap nest has become one of the essential fixtures of the poultry house.

Never in the history of the domesticated hen has man been so interested in her performance on the nest as at the present and the time is fast approaching when the fancy feathered drones will be found only in the museums carefully preserved for the benefit of the curious.

We wish to encourage broad thinking on this many-sided subject to defeat the too easily contracted habit of accounting for all success and all failures by the attention to some one detail or the lack of care in the employment of some other. The causes of success and failure are multiple and the dominant cause probably so obscurely situated in relation to the effect as to be unrecognizable except to the profound thinker. So we say be cautious in blaming or applauding certain conditions until you have exhausted all your ingenuity in trying to place the cause of your results elsewhere. The causes of failure are usually good resolutions poorly carried out; principles slovenly put into practice. If you know your house is damp—remedy it. If your birds are crowded—separate them. If they are infected with lice—get to work. Do not put such duties off till they have produced bad results. It matters little how much we know provided the knowledge is not made use of.

While careful attention to details will always be rewarded in

good results, still those details must be applied to properly selected principles to produce the best results. The conflicting opinions of breeders on the details of accomplishing certain ends are frequently confusing to the novice. This is due principally to the fact that a beginner pays more attention to details than to principle. This is an error. Study principles first—always, then carefully fit in details to suit the conditions existing in your particular case.

While poultry culture to-day is most largely achieved by following the principles scientifically laid down by actual experiment, still the manner in which these principles are put into execution is of the greatest importance. It takes brains to put on the finishing touches to your work and round out your success that will produce a feeling of pride and satisfaction when you view the result of your labor.

The desire for success on the part of the breeder must be intense enough to keep his mind engrossed with the study of the subject, and the love of his birds must be strong enough to compel him to spend all his spare moments studying their habits and characteristics and become acquainted with every symptom of health and disease. Otherwise he is not fully exerting himself in his own behalf.

We wish to warn our readers against the part degeneracy plays on the eve of success. Too rapid progress in culture without the necessary attention being paid to the development of constitutional vigor will almost invariably defeat the purpose desired. Healthy birds are the producers of progeny that may be depended upon to most nearly resemble the parents and the healthier the parents, the higher the percentage of correct duplication of the offspring.

As a healthy bird will resist disease and withstand unfavorable conditions much more readily than a weakened one, so can the healthy bird be depended upon to reproduce its kind with its own desired characteristics most strongly and truly marked, with better chances of improvement in those respects, and at the same time inherit a liveability that will keep them rugged and good to look upon. On the other hand, reversion must necessarily follow, producing a cull which might othewise claim prominence among the best of the flock. To take then what material is at our disposal and gradually develop a fowl that will accomplish a yearly record of 200 egg and better in large flocks, is the specific purpose of this book.

A. M. LaFayette, D. D. S.

How to Build Up a Heavy Laying Strain

All persons engaged in poultry keeping are, to a greater or less extent, interested in producing eggs, and since these world wide articles of commerce play such an important part in the diet of all classes and conditions of men, any means tending to increase the productiveness of the laying hen has an economic influence worthy of the most careful consideration of scientists and breeders.

Many readers of this book may not have the time, or for various other obvious reasons which will unfold in later pages, to go into the fullest details of pedigreeing, trap-nesting and selection, but there is no reason why anyone, by following the lines laid down in this book cannot increase the quantity of hen fruit of any flock. And in these pages we will deal with nothing but pure-bred birds. I am willing to admit that many people have very good success in securing a very satisfactory supply of eggs from a flock of fowls many generations removed from any semblance of ever having been pure-bred. This may be sufficient reason for not securing the blue-blooded birds, and to those very few persons it surely is, but the main factor in the case is at once apparent when for any reason it becomes necessary to perpetuate or improve on any particular feature of the parent stock. Here is where the pure-bred birds are at once necessary, for when one understands that any fowl may have had two thousand ancestors in the ten generations preceding it, and the law of reversion constantly recurring undesirable features, it is plainly evident that no one can afford the time, labor and expense necessary to improve such a multitude of bad features.

HOW TO START

The first process in starting to build up a flock of heavy layers is to have the layers. If you have a pure-bred flock begin with them. If you have mongrels discard them and buy a pen or trio of line-bred (will be explained later) pedigreed birds. I should prefer to buy yearling hens that have been tested for records for one year and a cockerel bred from a 200 egg hen, i. e. one having

laid 200 or more eggs in one year. In this way you have the time and study, as well as all the years of breeding, of the breeder right in your hands and years that he has spent in culling and selecting will be put in your yards for less than the birds are worth, figuring the patience and expense involved in carrying on such a tedious process as the strictest pedigree breeding involves. Pullets from tested hens are a very good investment because the breeder only keeps those hens for breeders that have established records, besides, in most cases, a long line of superior producers behind them, in turn. They may generally be bought much cheaper than the tested hens and many times one can secure a star performer with his first purchase.

An increasingly large number of buyers are beginning with eggs bought from breeders of the finest pedigreed stock, and in some instances, at least, this plan offers the best means of securing a start. It is a well known fact that breeders will very seldom sell their best birds and consequently anyone desiring the superior stock must buy eggs in order to secure the top-notch kind. But I have always believed that there was more satisfaction in buying the stock at the start. It figures out very much like this: Suppose you pay $25 for a trio in the fall. They will lay a number of eggs during the winter and the practice in caring for them will certainly be of not little value in learning to care for them at the time when the eggs will be the most valuable. Two well bred-for-eggs hens should lay at least fifteen eggs each per month through the three months of March, April and May or 90 eggs for the three months. These eggs would cost you $5 per setting of 15, or $30 for the six settings. You would not only have a larger number of chicks, in all probability, from your own eggs but the stock would be more uniform, and the old birds can be used for two or three years as breeders.

ONE OF MR. VAN ORSDALE'S HEAVY LAYERS

Egg record, 205 eggs in one year. Silver Cup winner at Bradford, 1906, score 94¾. This pullet and first cockerel won cup for highest scoring pair of Rocks, any variety. Cockerel dam by hen "Miss Bob White." Dam of second cockerel, Buffalo, 1907.

"THE TRAP NEST"

If you have bought fowls to start with the first step is to get a good trap nest. I have always used the Maine Experiment Station trap nest and find this perfectly accurate in its action, easily cleaned, and never out of order. These are the main factors necessary in any trap nest, the cost being a lesser item. But this is also a pleasing feature of this particular trap nest, as it is easy of construction, and simple in action.

THE NEW MAINE STATION TRAP NEST.*

The Maine Agricultural Experiment Station at Orono, Maine, state that their experience in trap-nesting large numbers of laying hens has served to point out very clearly and forcibly what are the points to be desired in an ideal trap nest. These points are:

First—The nest must be constructed so that it will be impossible for a hen to enter it without causing it to close and lock. Whether a trigger, treadle, or spring device is used it must be so adjusted as to operate without fail. Furthermore the ideal trap nest should be so sensitive that the same nest will be adapted to hens of different breeds. This is a matter of particular importance in hybridizing work where one may have in the same pen, for example, Bantam and Cochin or Langshan hens. Obviously one cannot insure that in a mixed pen a Bantam hen will invariably go to a nest which is built especially for her. All the nests should be so constructed that they will operate equally well with either a Bantam or a Langshan.

Second—The nest must be so constructed as to be absolutely certain to lock after it has once been sprung, so that a second hen may not enter while the first one is on the nest. Practical experience shows that this is an important matter. Types of trap nests satisfactory in other ways, often fail at just this point and to see seven hens and three eggs taken from the same trap nest at the same time, as has been the experience of the writers, is certainly not a recommendation for that particular type of nest.

Third—It is desirable that a nest be built in two compartments:

*This nest was invented by Mr. F. D. Sterry, Laboratory Assistant.

a rear compartment where the actual nest is located in which the egg is laid and a front compartment where the bird may stand after having laid and before she is taken out of the nest. If a front compartment is not provided there is great danger that the hen will break the egg by stepping on it after it is laid. Having two compartments, however, makes necessary a further provision. The nest must be so constructed that it will be impossible for a hen to lay in the front compartment without causing the trap to operate. A number of well known trap nests, including the nest which has formerly been used at this station, which are otherwise very satisfactory, are so arranged that the trap is not sprung until the hen enters the second compartment of the nest. It has been demonstrated in our work here that in such a nest there will always be a number of hens which will lay in the front compartment of the nest without entering the rear compartment at all. Such a hen after having laid passes out of the nest without springing the trap, and hence makes it impossible to obtain a record for that egg. It has been the theory in the construction of two compartment nests of the type mention that the hen would go into the rear compartment where the nest proper was made in order to lay. This may be good theory but as a matter of actual fact hens will more or less frequently lay in the front compartment of trap nests of this type.

Fourth—A trap nest to be ideal must be as simple as possible in construction and in operation. There are various types of trap nests on the market which no doubt are very satisfactory for the man who operates perhaps two or three such nests all told. These nests, however, are so complicated that it would be hopelessly impossible to operate and keep them in repair and working order for a flock of say 2,000 hens. If one is to use trap nests on a large scale and continuously they must not only be simple in construction but must be such that it will take a minimum of time for the caretaker to empty and set them. Trap nesting is an expensive operation at best and it becomes more expensive the more complicated the nest is.

Fifth—The nest should be durable and not likely to get out of order in such a way that it will not operate satisfactorily.

The trap nest now in use at this Station was devised to meet these requirements and has been found to do so in a very satisfactory manner.

DESCRIPTION OF THE NEST

The nest is a box-like structure, without fronts, ends or cover, 28 inches long, 13 inches wide, and 16 inches deep, inside measure. A division board with a circular opening 7½ inches in diameter is placed across the box 12 inches from the rear end and 15 inches from the front end. The rear section is the nest proper. Instead of having the partition between the

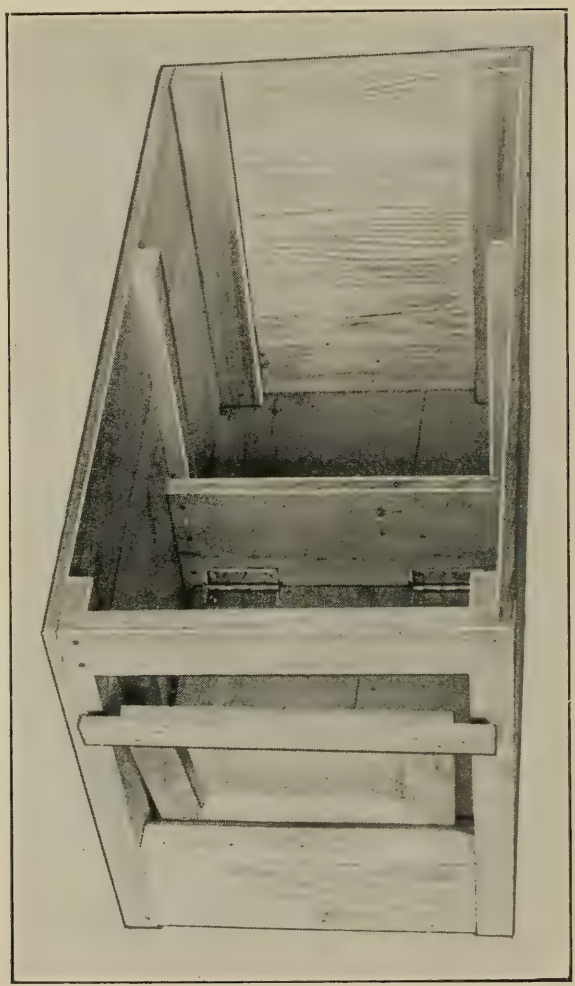


Fig. 1. Maine Station Trap Nest.

two parts of the nest made with a circular hole it is possible to have simply a straight board partition extending up 6 inches from the bottom as shown in Figure 1. The partition with circular opening is, however, recommended. There are several reasons why the circular opening appears to be better than the

straight board across the bottom of the nest. Experience has shown that a hen is less likely to go back and forth between the two partitions after she has laid when there is only the relative small circular opening between them, than when there is a larger opening. This reduces the liklihood of broken eggs.

The front portion of the nest has no fixed bottom. Instead there is a movable bottom or treadle which is hinged at the back end (Figure 1.) To this treadle is hinged the door of the nest. The treadle is made of ½-inch pine stuff with 1½-inch hard wood cleats at each end (Figures 2 and 3) to hold the screws which fasten the hinges. It is 12 inches wide and 12¼ inches long. Across its upper face just behind the hinges holding the

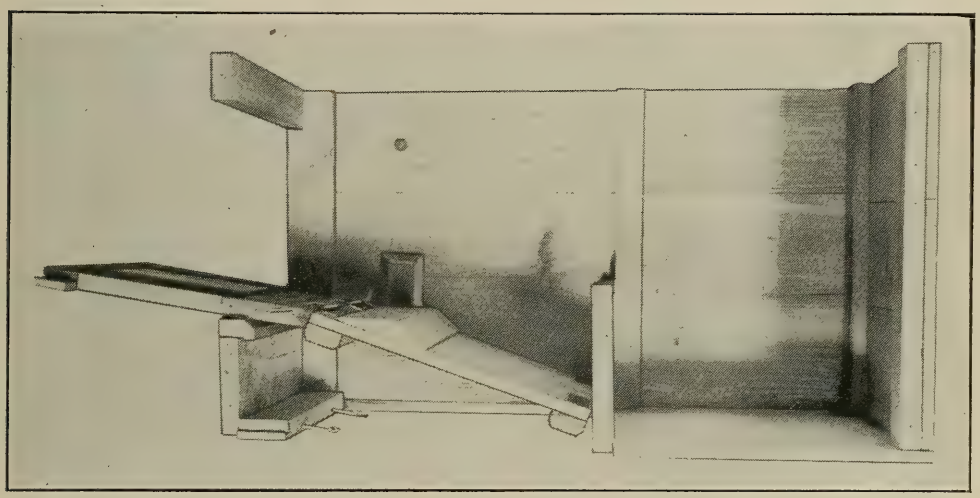


Fig. 2.

door is nailed a pine strip 4 inches wide beveled on both sides as shown in Figures 2 and 3. The door of the nest is not made solid but is an open frame (Figures 1 and 3) to the inner side of which is fastened (with staples or cleats) a rectangular piece of ⅛-inch mesh galvanized screening (dimensions 8 by 9 inches.) The sides of the door are ¾-inch beech stuff 12 inches long and 1½ inches wide halved at the ends to join to the top and bottom of the door. The top of the door is a strip of hard wood 13 inches long and 1½ inches wide, halved in 2¾ inches from each end. The projecting ends of this top strip serve as stops for the door when it closes (Fig. 1.) The bottom of the door is a hard wood strip 10¼ inches by 4 inches. The side strips are

fitted into the ends of this bottom strip in such a way as to project slightly (about 1-32 inch) above the front surface of that strip for a reason which will be apparent.

When the nest is open the door extends horizontally in front as shown in Figure 2. In this position the side strips of the door rests on a strip of beech 1½ inches wide beveled on the inner corner. This beech is nailed to a board 4 inches wide which forms the front of the nest proper. To the bottom of this is nailed a strip 2 inches wide into which are set 4-inch spikes from which the heads have been cut (compare Fig. 2.) The treadle rests on these spikes when the nest is closed. The

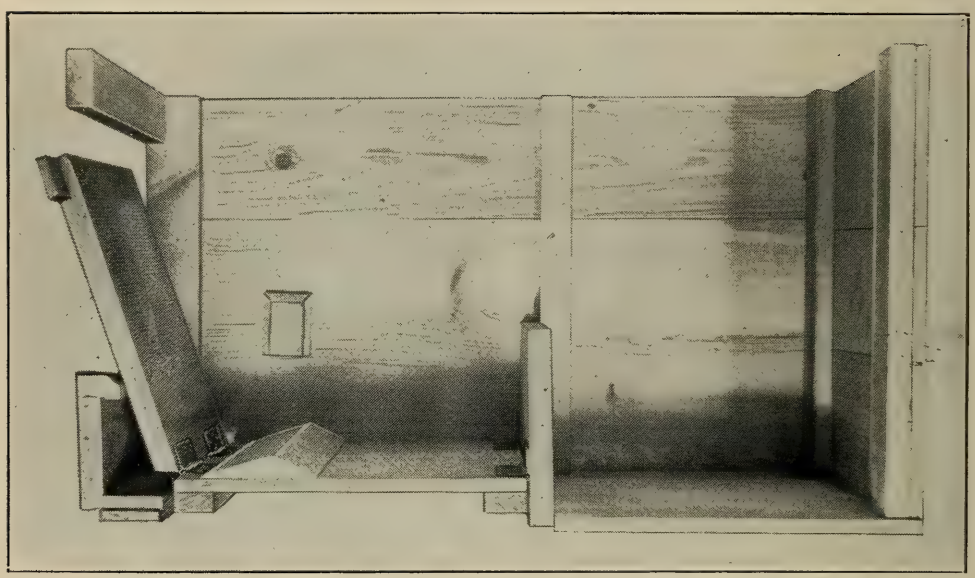


Fig. 3.

hinges used in fastening the treadle and door are narrow 3-inch galvanized butts with brass pins made to work very easily. It will be recognized that the proper working of the nests depends to a very large degree on these hinges. It has been found necessary to have the hinges made to order in order to get any which would be sufficiently loose. This can be done, however, without any cost above the regular price of the hinges provided the order is placed for a considerable quantity at one time.

The manner in which the nest operates will be clear from an examination of Figures 2 and 3 which show a sample nest with one side removed to show the inside. A hen about to lay

steps up on the door and walks toward the dark back of the nest. When she passes the point where the door is hinged to the treadle her weight on the treadle causes it to drop. That at the same time pulls the door up behind her as shown in Figure 3. It is then impossible for the hen to get out of the nest until the attendant lifts door and treadle and resets it. It will be seen that the nest is extremely simple. It has no locks or triggers to get out of order. Yet by proper balancing of door and treadle it can be so delicately adjusted that a weight of less than one-half pound on the treadle will spring the trap. All bearing surfaces are made of beech because of the well known property of this wood to take on a highly polished surface with wear. The nests in use at the Maine Station have the doors of hard wood in order to get greater durability. Where trap nests are constantly in use flimsy construction is not economical in the long run. For temporary use the nest door could be constructed of soft wood.

The trap nests are not made with covers because they are used in tiers and slide in and out like drawers. They can be carried away for cleaning when necessary. Ten nests in a pen accommodate 50 hens, by the attendant going through the pens once an hour during that part of the day when the hens are busiest. Earlier and later in the day his visits are not so frequent. Considerable experience is needed in trap-nesting before one learns how best to manage the hens at different seasons of the year with reference to this matter of time of removal of the birds from the nests. The tendency with one beginning trap-nesting is to visit the nests too frequently, not allowing a sufficient time between visits. The frequent handling upsets the hens and increases the number of "floor eggs" (i. e., eggs laid outside the trap nests.) The aim should be to provide enough nests so that visits to them need not be made oftener than once an hour, even during periods of heaviest laying. There is need for exact observation to determine what is the average time spent by a "non-broody" hen on the nest.

To remove a hen the nest is pulled part way out, and, as it has no cover, she is readily caught, the number on her leg band is noted, and the proper entry is made on the record sheet. After having been taken off a few times the hens do not object

to being handled; most of them remaining quiet, apparently expecting to be picked up.

One of the chief objections to the trap nest is the impression that has become so widely disseminated concerning the time it takes to attend to them after they are once installed. There is no foundation for such an impression because the daily operations around the poultry yard will practically cover every visit necessary. The hens do not seem to worry when confined in them for an hour or even two hours, and if the poultryman has some one who can make a visit to the coop about nine o'clock in the morning, again at noon, and once about three o'clock in the afternoon he need have no hesitancy about installing trap nests.

The advantages of them are many and it is difficult for one who has used them for a year or more to comprehend how successful advance can be made without their guidance. They never give a hen credit for an egg she did not lay any more than they give a hen credit for laying twice a day just because she happened to go on the nest twice. They pick out the star layer, the good layer, the poor layer, and the non-layer. If they are used during the breeding season and the eggs pedigreed, as well as the chicks, it is easily evident how certain one can tell which hen is producing the good birds and the poor ones likewise.

THE IMPROVED NEW YORK TRAP NEST.

During the past three years the College of Agriculture at Cornell University has been experimenting with trap-nests with the view to finding one that would be inexpensive to install, easy to operate, and that would be dependable. In all, six different type of nests were tested. Three were manufactured nests and the other three were inventions of the college. One of the latter devices is here described.

The main difficulty has been to get a nest that would be sure to work, would not catch more than one hen at a time, and that would be practicable to use on a large scale. Some of the nests were good, but were so large and cumbersome that it did not pay to operate them or to give them the necessary room in the poultry house.

Plates 1 and 2 illustrate the improved New York trap-nest which the department is using at present. This nest costs but little

more to build than the ordinary nest box, and can be used singly or run along in series, either under the droppings board or fastened to the wall. Plate 1 shows the nest installed underneath the droppings board. Plate 2 shows it in use on the wall. The wall form is preferred and has been tried with and without the hinged top. It would seem that the hinged top serves little purpose other than to facilitate cleaning and replenishing the nest with straw, because the hens come to the front of the nest after they have laid and will readily walk out when the trap is opened. (Plate 2, Fig. 2.) This nest is very sim-

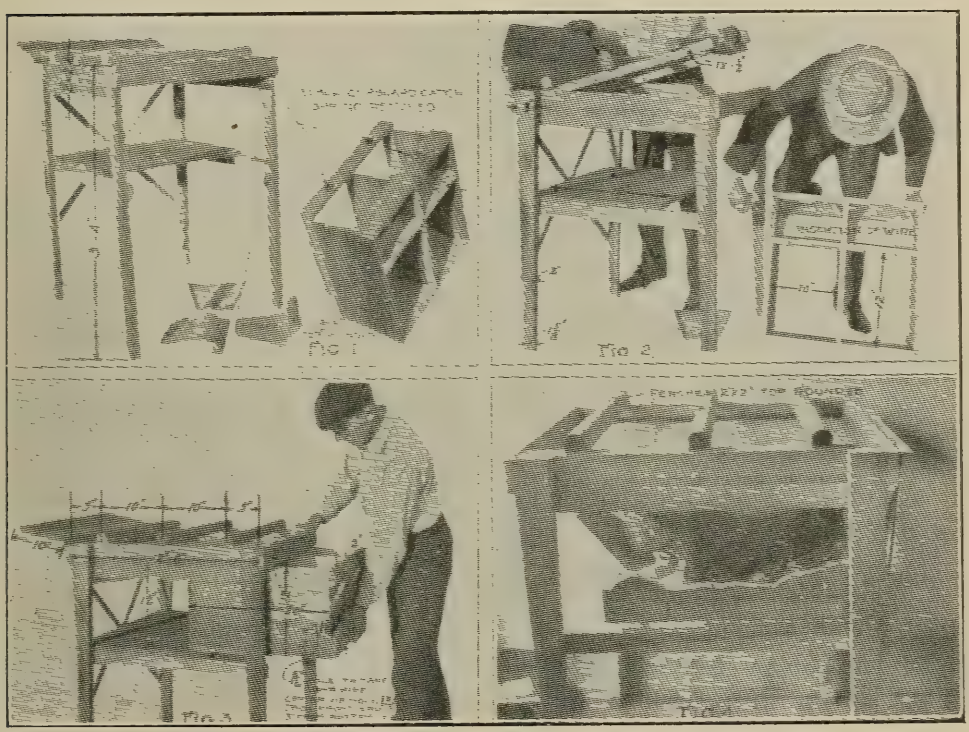


Plate 1. Four views of the Improved New York Trap Nest placed under the roosting device. Fig. 1 shows the nest removed; Fig. 2 the method of placing axle wire and also of removing the perches; Fig. 3 the drawer principle of placing the nest, and Fig. 4 shows the nesting and roosting arrangement complete with a hen entering the nest.

ple to operate. The fact that the trap in front is closed shows the attendant that there is a hen in he nest. (Plate 2, Fig. 4.) When he removes the hen he has reset the nest. The trap, being of galvanized iron, does not offer a very inviting place for the hens to loaf, and so does away almost entirely with the possibility of more than one hen entering the nest. (Plate 2, Fig. 1.)

When the nests are put under the droppings board, the floor

comes under the nest part only. (Plate 1, Figs. 1, 2, 3 and 4.) This is to keep any straw from getting under the trap and preventing it from working easily. The nests are built in secitions without top or bottom, and are slid in underneath the trap parts, much on the same principle as a table drawer. (Plate 1, Fig. 3.)

The wall nests are placed on brackets or are screwed to the wall through the back of the nests. The tops are made slanting to prevent the fowls from roosting on them. The bottoms are made of one-half inch mesh galvanized hardware cloth, which goes under the nest parts only, the end sought being a nest with as few places as possible for mites to breed and that is self-cleaning. This is an experiment that is giving satisfactory results.

The dimensions given for the nests (Plates 1 and 2) are for Leghorn fowls. To use these nests with larger breeds, it would be necessary only to widen the opening at the entrance (Plate 2, Fig. 4) one inch and to lengthen the front of the trap (Plate 2, Fig. 4B) one inch.

Prof. James E. Rice, instructor in Poultry Husbandry at Cornell University, says trap-nests are indispensable for investigational and instructional purposes, and for persons who desire to sell pedigreed stock and eggs for hatching.

The labor involved in collecting the eggs many times a day, keeping the record of each hen, hatching with pedigree trays, toe-marking and leg-banding the chickens, requires more exacting work and close attention to detail than most poultrymen at the present time would care to undertake, even though the reward may be great in the building up of a strain of heavy producers.

For the poultryman or farmer who does not care to sell pedigreed stock, but who desires to increase the laying capacity of his fowls by breeding from the most productive, the plan is suggested of trap-nesting each year the choicest pullets for the first six months or more of their first laying year. From these select the most productive pullets to be used as breeders the following year, that is, when they are two years old from the shell. It has been found that pullets show early in life their egg-laying capacity, so much that pullets of the same age and variety given smaller care, that lay the largest number of eggs during their first year from the egg, will, in all probability, be the most prolific individuals in the flock. This method

will do away with trap-nesting the entire year and will permit the record making to be done during the six months, approximately, October, November, December, January, February, and March, when the time can best be spared on a general or on a poultry farm.

For the poultryman, however, who is adapted to the work and who will trap-nest conscientiously and continuously, and who will breed intelligently, we think there is large reward. The reward will come first by increasing the yield per hen and thereby the profits for

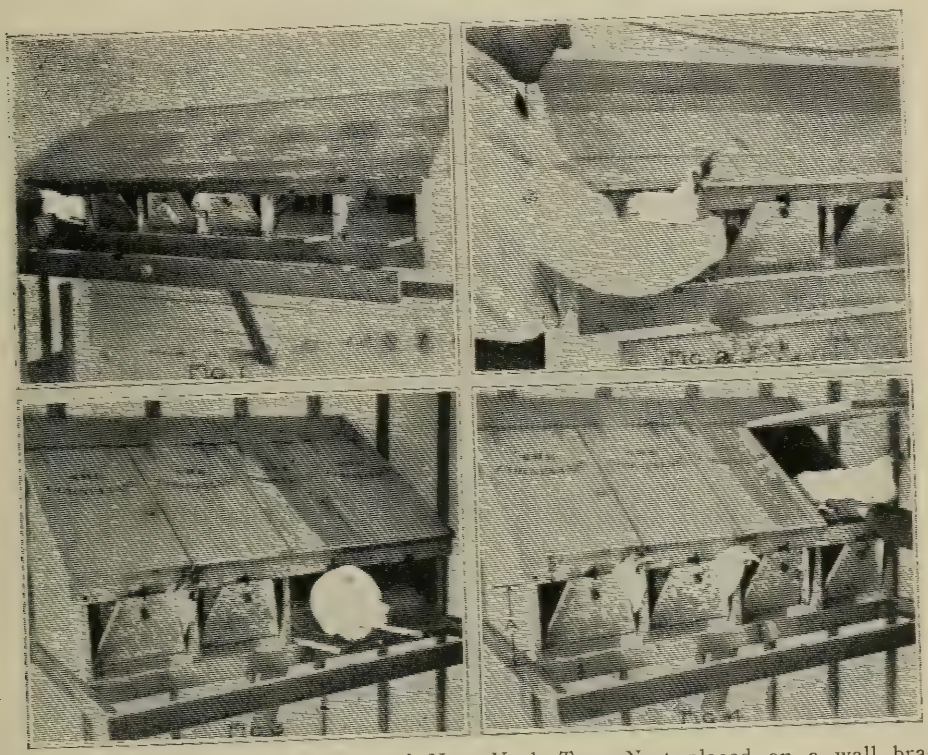


Plate 2. Four views of the Improved New York Trap Nest placed on a wall bracket. Fig. 1 shows nests both open and closed with hen ready to be released; Fig. 2 shows method of removal of hen; Fig. 3 how the hen enters the trap; Fig. 4 the incline cover lifted for removal of hen or for cleaning.

commercial egg production, and, second, by the production of pedigreed stock for breeding purposes and eggs for hatching. The latter will require, in addition to the special knowledge of how to feed, house, trap-nest and to breed poultry in order to secure large production and vigorous stock, a special training and adaptability in selling in order to place the product before the buying public. This means skillful advertising. It will require time and skill, but we think it will pay both in financial reward and in the satisfaction of having contributed something toward the up-building of a superior

strain of poultry and setting a notch higher the standard of perfection in egg production. The trap nest has an intellectual as well as a financial incentive.

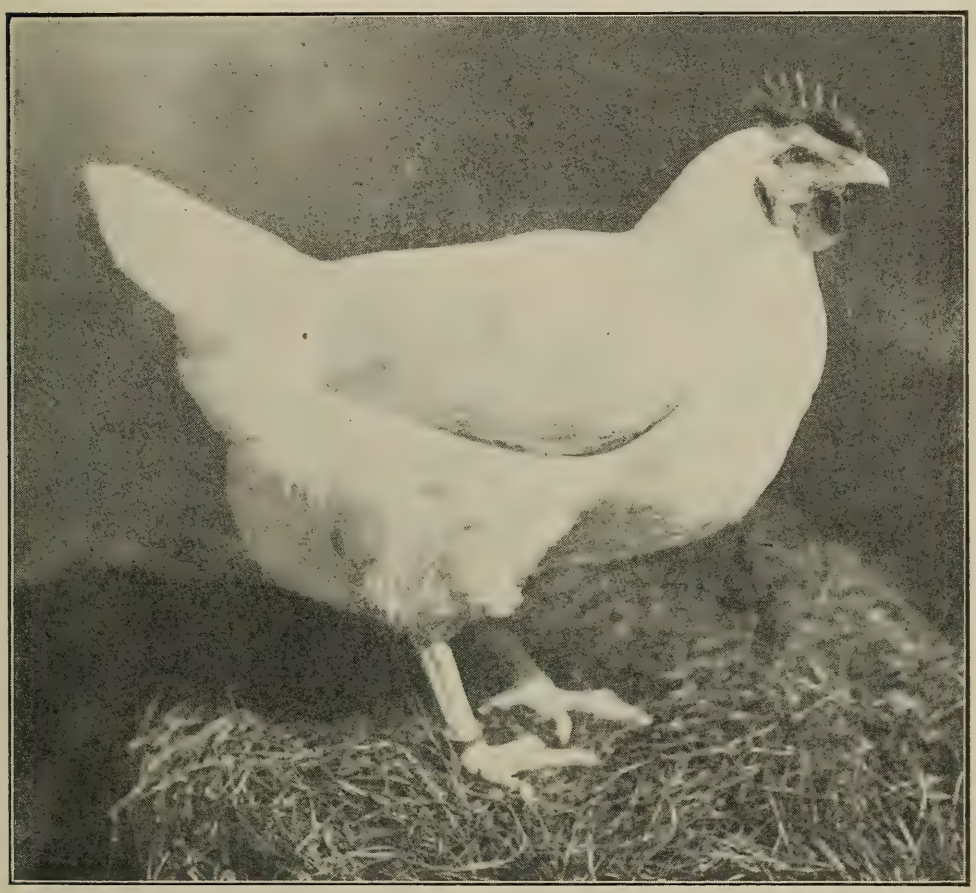
AFTER INSTALLING THE NEST.

After the trap nests are installed each female should be leg banded and a record kept of her age, number, weight and Standard points—if you are to include fine feathers in your breeding operations. Every breeder should have a copy of the American "Standard of Perfection," a book which may be purchased of any of the poultry journals, and which contains a description of all the varieties of poultry and illustrations of the leading ones, both male and female. About the best education a beginner can secure is to visit a poultry show, and there compare the different varieties side by side. He might study the Standard year after year and still not be able to tell whether a bird was a good specimen or a poor one. This is apparently an incongruity after telling a person to buy a "Standard," and then telling them that it is impossible to know a good bird from a poor one. But the truth of this assertion lies in the fact that the eyes is the only true indicator of shape and color. Then another factor is the unfortunate difference in opinion of judges in regard as to the interpretation of the descriptions in the "Standard." And it must be admitted that this is a condition much to be regretted.

The best time to secure the stock is in the fall, say September to December, then you will be able to get a line on the females as to winter egg production. It is worthy to note here that the pullets that do not lay at least 50 per cent during December and January will never be steady layers at any other season of the year, save possibly when eggs are very low in price, but for best results they should be discarded from all future breeding operations.

Considerable discussion has been rife concerning the 200 egg hen, and even some men who should know better have been led to the extreme of stating that the men now engaged in breeding a 200 egg strain were "200 egg liars," but the facts in the case are that the 200 egg hen is an actuality and when properly bred and fed can be reproduced in no uncertain manner. But when you see the advertisement of a 200 egg strain you can make up your mind that the writer of the ad. is not unwilling to strain a point in favor of

his own particular brand of misrepresentation in order to separate you from your hard earned money. Two hundred eggs is a very high record and one that is not likely to be reached by large flocks,



MISS BOB WHITE.
Egg record, 228 in one year; 160 eggs second year. Dam of first cockerel and cockerel special, Bradford, 1906, also winner of first cock, 1907. Dam of second cockerel, Bradford, 1907. Dam of hen No. 33, 211 eggs; hen No. 31, 209 eggs; hen No. 39, 172 eggs; hen No. 313, 196 eggs; hen No. 331, 206 eggs; hen No. 314, 202 eggs. Photo taken during breeding season. Note the long body and immense capacity for egg organs. Score in competition, 93½.

but in order to have some recognized standard of performance 200 was taken as the mark of a standard performer in the same manner as 2:30 was taken as the time of a standard horse.

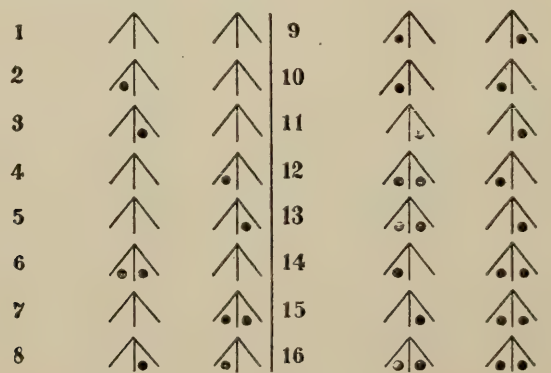
PEDIGREE BREEDING

The object in pedigreeing any animal is the advantage gained in knowing the real producers, and the rules of breeding hold true whether you are working with chickens, cattle, horses or hogs.

Pedigree breeding consists essentially in knowing the sire and dam (father and mother) of each and every chick. It is not possible to pedigree-breed by any other method than by the trap nest, unless one just mates pairs of birds and this is not practicable in any extensive breeding operations. Pedigreeing from pens is not pedigree breeding, strictly speaking, any more than colts bred from a bunch of wild horses would be called pedigree bred.

The first step necessary is to trap nest the layers and, as each has its individual leg band, to mark this number on the egg when taken from the nest. In each pen there should be a record sheet having the numbers of all the hens in the pen marked on the left hand side, and the days of the month written across the top. By drawing lines clear across the paper both ways it makes a small square for each day opposite each hen's number. When you have six or seven eggs from this one hen they should be set under a separate hen, or in a separate tray in the incubator. Or seven eggs from two hens may be set under one hen and on the eighteenth day all the eggs from one hen of the same number are removed under another hen. In this way you will always know the mother of the chick, and the "hen that lays the egg is invariably the mother of the chick."

As soon as the chicks are well dried off and before they and their mother are taken from the nests the chicks should be toe-marked or leg banded, or both. The method of toe-marking is to punch a small hole in the web of the foot between the toes—keeping a record of which punch marks belong to each particular hen. All the chicks in one season from each individual hen should be punched in the same web, or webs, as follows:



Another method, and the one used where more than sixteen breeders are used is to mark the chicks when taken from the nest with "open pigeon bands." These bands may be secured from any leg band maker. This is by all means the best way to mark them as it does not disfigure the feet and there is no danger of losing your record by reason of the holes growing shut which often happens in toe-marking, unless the chicks are carefully watched and the holes kept open. The chicks' pedigrees are kept like this:

Hatched		234
March 15	Sire *777*	150
120		209 eggs
130		
140	Dam *72*	
150	Record	*267*
160	205 eggs	228 eggs

"FEEDING THE CHICKS"

No other one element is so closely related to the success or failure of the prospective poultry keeper as the feeding of the chicks. Many persons have the ability to successfully hatch the chicks, but the real test of a poultryman is the degree of success that attends his efforts to start them growing.

The subject is not so full of terrors as one may be led to believe from the above statement, but when a person without previous experience begins to deal with chickens the first impression is that he is dealing with something that needs coddling and nursing and all sorts of dope and doses to make it unwell even if it is naturally strong and healthy. And a chick that is hatched from sturdy parents can stand almost any amount of neglect and still make rapid growth, provided it has a fairly constant and reasonably nutritious supply of food. The greatest factor about the whole subject is to mix a little common sense with the feed. Feed any time after twenty-four hours old. For the first feed give bread crumbs, preferably from bread several days old, just barely moistened with fresh milk, three times a day for a week. This is not to be their whole feed, however, for it is necessary to provide some hard grains, not alone for their feeding value but for the benefit of giving the chick the exercise essential to keep it growing and in good health.

It makes no material difference whether the moist food is fed in the morning or whether they are started on the hard grains, as a morning appetizer. But I have always used the bread crumbs as the first feed, being careful not to feed more than they will eat up clean in 5 or 10 minutes (depending on how often they are fed and the best way is to feed little and often,' then the next feed is the hard grains scattered in a little cut straw. But it will be found profitable to feed every two hours the first week, alternating the moist and dry feed. For the hard grains there is absolutely nothing better than the old fashioned steel-cut oat meal; this is beyond any doubt the one best feed for chicks the first three weeks. It is understood that there are some very good foods among the prepared chick foods, and they will be found to give good satisfaction, and even with the oat meal will form a pleasing addition to the variety essential in any ration in order to secure the maximum results in growth and good health. It should be borne in mind that the straw for litter should not be over one inch deep the first week.

The essential feature in any ration for young chicks is that the feeder himself should have the common sense to know when the chicks were well fed or poorly fed. It, of course, must be admitted that there is no set rule so sufficiently mechanical that it can be written out and a magnificent success made with it from the start. The successful feeding of the chicks, in the strictest sense, is a matter only learned by years of close observation, and it is a fact easily verified by the older breeders that the form and shape of a bird is materially made better or worse according to the actual variation in the nutritive values of the ration. There is also a difference noticeable in the growth of birds of two different strains. This is proven that if fowls have been reared for a number of years under conditions nearly ideal, and are moved along side of fowls that have been poorly nourished for a like period, the fowls that have had the results of the superior care will grow faster, thereby making better use of the same amounts of food than the fowls kept under the uncongenial conditions, though each may have originally eminated from the same source. If there was no other reason for keeping pure-bred birds than this one, it is, in itself one of the greatest arguments for keeping fowls of known purity of blood.

Now there is a vast amount of difference in raising chicks in

January or in June, and the breeder who does not take into consideration the vital differences will never reach the greatest success with the chicks of either period. The early chicks of January, February and March come into the world at an unnatural period and therefore, must have to a certain extent, unnatural conditions under which to thrive. If one element more than any other is essential in the growth of the early chicks it is exercise. In the operations of the writer these early chicks have much the same care as the later ones, except that more care is given that they are never overfed, especially during the first week. After the first week one of the pens in the brooder house, 5 by 11 feet, is swept clean and a thick layer of the cut oat meal and prepared chick food is scattered over the floor. On top of this is spread about one inch of fine cut straw, and again on top of this another layer of the feed, then a layer of straw until the whole floor is covered to a depth of five or six inches, and the litter contains 12 or 15 pounds of the grains. Here the week old chicks are placed and it will be surprising how soon they will learn to scratch clear down to the floor in search for the grains. At times they will be nearly buried out of sight in the litter, and the growth is certainly fine. After the second week a small plate is put in the pen and a little of the very best beef scrap, such as costs about $6.00 a hundred is put on the plates every other day. In self feeding hoppers along the sides of the pen is placed fine charcoal, sifted oyster shells, chick grit and fine granulated bone. This is kept there from the first and care taken never to have the supply run out. This plan has been tried experimentally with different pens of Plymouth Rocks, Leghorns, and Wyandottes side by side with pens hopper fed on the same rations and in every instance the growth of the chicks fed in litter was from 15 to 20 per cent faster than the chicks hopper fed. In fact, the results were so conclusive that the hopper feeding has been replaced by the one feeding a week on many practical and fancy plants. After this litter is removed it is thrown into the laying pens where every kernel of grain is worked out. The whole system set down here revolves around the fact that the success of winter chick rearing depends on exercise, more than any system of feeding. The great advantage apparent from following the above plan is the amount of labor it saves where many chicks are reared, and the very satisfactory growth also com-

mends it to fanciers who only raise a few birds, but who desire to secure the best growth and largest size.

The process as has been outlined will solve the problem of raising the extra early chicks, now for the later ones. It is easily recognized by every one that the late chicks come into the world at the time nature intended them to and therefore nature has provided many, and in fact, all the conditions necessary for the most rapid growth. These later chicks, if given unlimited range, may be largely neglected, so far as food goes and still make a reasonable amount of growth, but the down-to-date poultryman is looking for the conditions that hasten this development in the most favorable

The free range where chickens get plenty of exercise and green food on clean land, at Cornell University, Ithaca, N. Y.

manner and consequently he hastens to provide in liberal quantities all the various food that promote the most profitable growth. But the writer has always advocated unlimited supply of green food for all growing chicks, as well as lots of shade, for the late ones. The green food should be lettuce, rape, young beet tops, or fresh lawn clippings and if one has not been in the habit of supplying any or all of these he will be astonished how much a hundred chicks will consume every day, and will also notice a diminishing in the amount of grain food eaten.

All my chicks are carried along the first week on the same rations, those with mothers that are hatched in April or early May are given a separate coop with a large outside run and are hopper fed after the first week. They now receive the necessary exercise in another way but it serves the same purpose. Do not forget to feed these youngsters all the tender green stuff that they will eat because the chicks cannot pull the old tough grass and will not eat nearly as much of it as they do of the green truck, even though their yards be well covered with grass.

DRY MASH AND THE WET MASH

Much has been written for and against both systems of feeding, and, like a good many things that are advocated as "one of the greatest discoveries of modern times," neither system has the advantage of a combination of the two. And in the same line of thought neither method is as modern as some of the so-called originators would have us believe. As an illustration of this, I was talking to my father one day about the new method of feeding and he remarked that in 1870 he fed the chicks of his employer by dumping a sack of whole corn, one of wheat, and one of oats in different boxes near the henhouse and that this was the only method of feeding practiced, and it produced eggs.

In regard to the relative values of the dry and wet mashes as a system of feeding it is now admitted by the best authorities on the subject that a rational combination of the two will produce the most satisfactory results. There is no doubt that the birds can be induced to eat a larger amount of the wet mash, but the objection to this is that it is very apt to produce a diseased condition of the liver. Those who have practiced both methods are emphatic in pronouncing that the largest birds are grown on a combination of the wet and dry mashes. It is a well known fact that the more feed a bird can be induced to eat in combination with a reasonable amount of exercise the larger it will grow and the more quickly will it reach maturity. It is the practice of the writer to feed bread and milk for the first three or four weeks. After this the bread and milk is gradually displaced by a mixture of two parts, by weight, of good clean bran, two parts of corn meal, one part middlings, or "red dog flour," and one part sifted fine beef scraps. This is used as a wet mash and is mixed with a little skimmed milk or water until it crumbles readily. It will not take very much to make it sticky and this is to be carefully avoided as it has a tendency to loosen the bowels excessively. Rub the mixture with the back of a spoon until it is moistened all through—not wet—and there is no danger in feeding it. This mash is fed twice a day until the birds are six or seven weeks old. I would caution you especially about having the mash correctly made in order to avoid any bowel trouble, not

that there is any danger in feeding it when correctly made. The chicks are carried along on this in connection with the hard grains in the hoppers. In the morning I place the mash on open plates only feeding as much as they will clean up in five or ten minutes. The amount can be judged quite accurately after feeding a few times. The plates are then removed and cleaned. In the evening all the mash is given that they will eat. It is important that the food left over is removed at once as it sours quickly and then becomes a source of danger.

AFTER SIX WEEKS OLD

At this age the cockerels and pullets are separated, and also the cockerels to be marketed and those to be kept for breeders.

A row of Colony Houses at State College of Agriculture (Cornell University, Ithaca, N. Y.)

The breeding cockerels and pullets are put in open front colony houses on free range, or in very large yards, and are divided into flocks of 25 each. The feed is now gradually changed from the moist mash to the dry mash fed in hoppers and kept before them all the time. This is made up of one part wheat bran, by weight, to two parts corn meal, one part middlings and one part beef scraps. In addition to this cracked corn, wheat, beef scraps, cracked bone, oyster shell, grit and charcoal are kept before them in self feeding hoppers

all the time. It will be found that they do not stand around the troughs and gorge themselves but take a mouthful at a time and go ranging over the fields, only coming back to the hoppers when hungry.

The object in feeding in this manner is to save labor, and it can be appreciated that where the feeding may be done once a week by a man and a horse, it is much easier and cheaper than to make from three to five trips a day over the whole plant. The results from this method of feeding are as satisfactory as under any method of hand feeding, and this should commend it to every poultry keeper who raises a few chickens as a little diversion and does not have the time to be at home every time it is necessary for them to be fed.

The cockerels to be kept for breeders are fed in much the same manner as the pullets, only more feed must be provided. The cockerels to be marketed are put in a house about 9 by 11 feet in size, with a yard 20 feet square around each house, 20 cockerels in a house. They are fed on a wet mash made of 100 pounds of wheat middlings, 100 pounds of corn meal and 40 pounds of meat meal. This is given as a porridge thick enough to drop but not run from a spoon. The following observations from the Maine Station bulletin are well founded: "Four weeks is about the limit of profitable feeding, both individually and in flocks. Chickens gain faster while young. Birds 150 to 175 days old give comparatively small gains. The practice of successful poultrymen selling chickens at the earliest marketable age is well founded. By using skim milk in mixing the porridge, instead of water, 4.3 pounds of grain were required to make 1 pound of gain, against 5.3 pounds of grain when mixed with water.

HATCHING THE CHICKS

These different phases of poultry keeping are so closely and so intimately connected that it is a very difficult matter to assume where one subject begins and another leaves off, however, the different chapters will follow each other in as rational a sequence as possible. We have already given our views on feeding the chicks.

It is an axiom appreciated by every experienced poultryman that a chick "well hatched is half raised," and as the beginner gains

in experience he will be more able to accept this assertion as the truth. It is truly wonderful how a chick that has been properly hatched from strong and sturdy parents will grow and thrive even in the coldest weather and under conditions that would kill a chick improperly hatched in one day. In this struggle of nature there is a constant selection of the well and fit being made and often it appears that an especially good bird from the standpoint of form and feathers is a little backward in growth, or is in need of special care in the matter of housing and feed. The outcome is usually this: The bird being so fine is used for a breeder and this apparent weakness is really a constitutional defect which is bred into the flock and as a result the whole strain is weakened. The chicks are weak when hatched and never grow as strong and and healthy as a youngster should. As a result they are coddled and nursed to a doubtful maturity, and in turn the breeders are selected for their form and color instead of their health and vigor. The results of this sort of selection are evident to any careful observer, and it is stock of this kind and eggs from such parents that the buying public are yearly fleeced of thousands of dollars in good hard earned money. We do not believe that this sort of selection is practiced by the old and experienced breeders as much as by the young and unknowing ones who are willing to chance a questionable mating thinking that it will turn out all right.

It is reasonable that nature should have first call in hatching and brooding the choicest youngsters, and it is also true that taking the average of results the hen is far superior to an incubator as a producer of the largest percentage of strong, livable chicks. As a brooder I have always had better success in raising them by artificial means. I do not say that an incubator cannot hatch as many chicks as a battery of setting hens—when the incubator is run under perfectly normal conditions—but there is the rub—to always operate the machine so that the eggs are incubated under perfectly normal conditions for the entire 21 days. Here is where the machine falls far behind the old setter.

Provided you have a fairly representative specimen of a clucking hen you can trust a setting of costly eggs to her with far more assurance of securing an equal number of chicks than you have with the same quality of eggs entrusted to an incubator. Under

the setting hen your eggs have no chance of being overheated or a thousand and one things that are possible and probable to happen to your incubator. Of course, where a large number of eggs are incubated it becomes necessary to depend on other than the natural means of hatching, and this is possible with almost any of the improved patterns of mechanical hatchers on the market today. Of course the incubator manufacturers will come forward with a large batch of statistics and well meant testimonials to prove that the writer is leading you astray by advising that for the best results with fine stock or costly eggs is to stick to the old setting hen both for the incubator and for the brooder. I am willing to admit that hundreds of prize winners are hatched artificially and brooded by a wooden hen, and I still contend, with thousands of other breeders that the same chickens naturally hatched would have been finer specimens. Right here I want to say that the most important development in artificial incubation in recent years is the application of the sand tray to the aid of the machine hatcher. The chicks hatched from a sand tray incubator are not only heavier when hatched but are covered with a longer, thicker fluff, are stronger and far more vigorous than any I have ever seen taken from a dry air machine.

In operating the incubator there are a few "first aids to the amateur" to be considered. The maker of the machine of whatever particular make, will furnish you with certain fundamental rules which ought to be closely observed. The machine must set level. Do not run any machine with the thermometer hanging up unless you use two in the machines, one hanging and the other on the eggs. Set the incubator in a cellar, preferably. Use the very best oil. Run first week (with lay down thermometer) at 102 degrees; second week at 102½ degrees; third week at 103 degrees. This is the temperature that it is advisable to maintain in a cellar where it will average 50 to 60 degrees. When the weather is warmer and the cellar is not lower than 70 degrees the machine should be operated at 101, 102, 102½ degrees the first, second and third weeks, respectively. (This is with the thermometer on the eggs.) It should be remembered that the first few days of incubation are the vital ones and the temperature should not be allowed to go very much over 103 degrees, and should be held as near to 101 or 102 degrees as possible.

I would advise anyone who has one of the hot air type of incubators to try the plan of the sand tray machines, at least, in an experimental way. This consists in placing a tray that is about one-half inch deep under the egg tray, and keeping it nearly full of sand. This sand is kept constantly wet throughout the entire hatch, up until the eighteenth day, when it is removed. Anyone who has never tried this method will be agreeably surprised at the size and vigor of the chicks. The last word that the writer has to offer on the subject of hatching is for the operator of the machine or of the setting hen, to let both very much alone until it becomes absolutely necessary to readjust the thermometer, or wash the eggs, or some such positive action. Don't monkey with the regulator just because the heat isn't within one-half a degree of what it was before you turned the eggs, and don't lift up the old setter while the chicks are coming out just to see if they are really there. Both operations are conductive to no good.

FEEDING THE HENS

It is to be remembered that egg production is not at all a matter of breed or variety. It is first of all a matter of feed, then a matter of care and finally a matter of strain.

The best laying strain of chickens in the world if put into uncongenial quarters, fed unwholesome food and given indifferent care will deteriorate into fowls perhaps more profitable than the former flock of mongrels kept under like conditions. The reason for this is very plain inasmuch as the highly productive fowl is the result of years of careful feeding, more careful breeding and systematic selection. The mongrels having become used to inferior care and feeding have reached the level only possible under such conditions and being maintained as such for a series of generations have ceased to be nourished into a state of productiveness. The writer does not argue that mongrels are not profitable in some cases, but the difficulty is apparent when one begins to breed for improvement. The multiplicity of ancestors which may exceed 2,000 in the ten previous generations makes profitable improvement an endless and unprofitable task. Whereas, if pure bred birds are given the same care and general treatment that made this flock of mongrels productive the results would have been very much more

profitable, and improvement by selection of breeders merely a matter of care in mating.

Good layers is not a question of breed, nor a question of variety—but entirely a question of strain. I. K. Felch's strain of Light Brahmas have egg records that would put to shame some of the best bred and much touted heavy laying White Leghorns—its merely what the man behind the hens breeds them for—eggs, meat, feathers, or all three.

As so much importance is attached by all straightforward breeders to the feeding in addition to the breeding it behooves one to study this matter at length and also to apply earnestly his best powers of knowledge and observation in order to produce a satisfactory supply of eggs.

As the chicks have been well fed during their entire youth, they should come into laying well developed in size, and in such condition as to put forth an abundance of nice, large eggs during the entire winter.

Now that they are in laying shape the yield of eggs should be practically continuous, and if they have the inheritance of well bred "bred-to-lay" parentage; have been normally hatched; have been normally brooded; have had an abundance of sound, clean feed of the correct sorts; if they are now fed with more common sense than corn, they will lay and keep at it.

The regular laying ration is made up, by weight, of 200 pounds of wheat bran, 100 each of corn meal, middlings, gluten food and beef scrap, and of 50 pounds of linseed meal. If this amount of linseed makes the bowels too loose reduce the amount until the bowels become normal. This is mixed up in a trough, with a shovel, and carried in pails to each pen where it is kept before the hens at all times in self feeding hoppers. They do not like the dry mash well enough to eat too much of it, and you will always find them ready to scratch for a kernel of grain.

The pens are kept well covered to a depth of six, eight or ten inches with clean oat straw, renewed every two weeks in winter and every four weeks in summer. In this straw is thrown for the morning feed four quarts of oats put to soak in boiling water and allowed to stand over night, or four quarts of sound, clean wheat. This is raked, forked or kicked well under the litter, and the hens

will soon be heard singing, scratching and pecking—happy as can be—and these are the conditions which makes for us a full egg basket. At noon, every day, cabbage, carrots, beets, mangled wurtzels, potato parings or steamed clover is fed—a good liberal amount. About four o'clock in the afternoon four quarts of whole corn is fed in the litter. On excessively cold days the amount of corn is increased to 6 or 8 quarts for each hundred hens.

The whole matter of feeding depends to a large extent upon the experience of the feeder. A good feeder will know when the fowls are receiving the proper amount of the proper foods, not only by the eggs produced, but by observation and handling. Of course, when trap nests are used the breeder is brought into individual contact with practically every hen in the pen in the course of two days, and he, knowing the exact condition of each bird, can tell at once whether the feeding is correct or not.

It is understood, of course, that oyster shells, grit, charcoal and beef scraps are to be kept in self feeding hoppers at all times and the supply never allowed to run out. While a great many people seem to have, when neglecting to provide any of these elements or at least say they have, good egg yields, it is nevertheless true that the greatest number of eggs will be produced and at least cost when the necessary egg forming elements are provided in the greatest abundance.

With all that has been said and written about this matter of egg production it must be forcibly remembered that it depends as much on the element of exercise as upon the matter of any kind or condition of feed or feeding. Not that the hens will lay when underfed, but this constant exercise will do much toward offsetting the dangers and bad habits incidental to overfeeding.

The eggs depend more upon the head that carries the feed pail than upon what the pail contains.

HOUSING

More attention has been paid of late years by all poultry keepers in securing comfortable quarters for their chickens. This endeavor has taken rather radical grounds in comparison to the oft quoted adage "That poultry should be kept warm," inasmuch as the most practical houses of the present day represent a house that is little warmer than outdoors.

The house in use by the writer is an adaption of the Cornell laying house, No. 1 shown here in the illustration. This house is built in units each twelve feet wide by sixteen feet deep, 5 feet

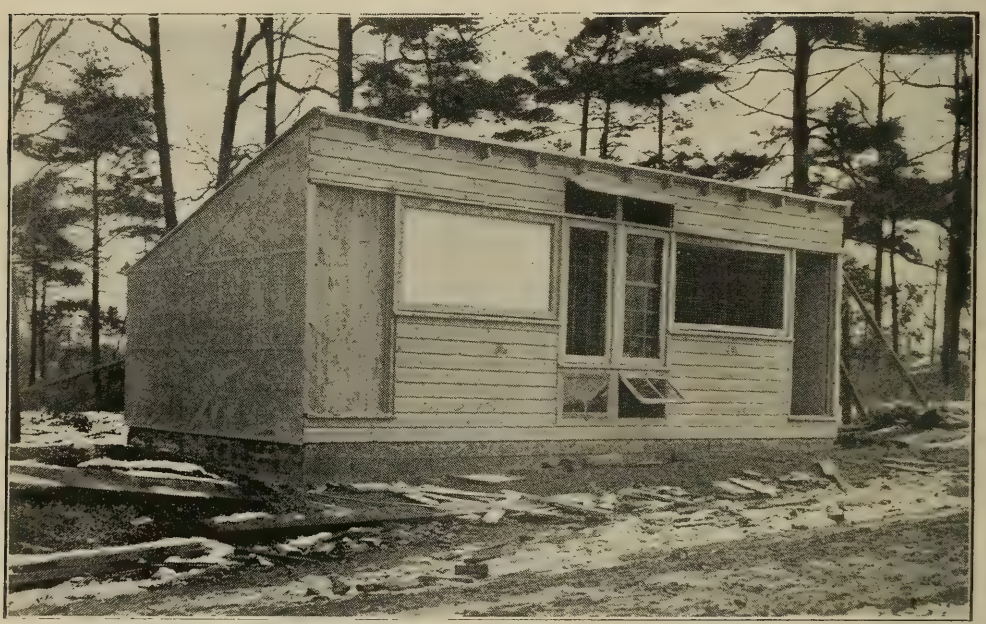


Fig. 1. Model Laying House for Poultry, advocated by the Department of Poultry Husbandry of the New York State College of Agriculture at Cornell University, Ithaca, N. Y.

at the back and 8 feet in front; in the front of each one are two windows each 4 feet, 6 inches long and 2 feet wide in two sashes. These windows are placed as close to the ends of each (one at each side) pen as the construction will allow. Three feet from the floor and between the two windows is a space two and one-half feet wide in which is fitted the muslin curtain. The frame for the curtain is made to fit closely in this opening, and swings in and fastens to the rafters when not in use. My frames are covered with the common six cent muslin. Do not buy the oiled muslin that is advertised for this purpose because the oiling defeats the object of the curtain.

Along the back of the house and thirty inches from the floor is placed the dropping board. This is made of matched flooring and is 42 inches wide. On top of this, in swinging brackets, are two roosts, each ten feet long, made by planing the corners off 2 by 4's and setting them on edge. The brackets are hinged at the back to swing up out of the way when cleaning the dropping board. In front of the dropping board is another cloth curtain which is fastened to the rafters and drops down fitting closely at the sides. This is only used when the temperature is likely to go down to zero, or close to it. In the writer's house the dropping board extends the whole length of the pen, and the end not occupied by the roosts is used as a storage box for the winter's supply of road dust. It is handy to the dropping board and there is quite a saving of labor to have it in each pen. It is also available for the winter dust bath.

Each pen is occupied by 25 hens or thirty pullets. Along one wall is placed a self feeding hopper six feet long and the dry mash is fed in this. Along the other wall are the shell boxes and beef scrap hopper. A battery of six trap nests is arranged under the dropping board at one end of the pen, two tiers high, and made to slide in and out like drawers. A solid board partition separates each pen. This is necessary in order to prevent draughts..

A great many people are skeptical as to the practicability of an open front house such as this in a cold climate, but the fact that this type of house has been adopted by practical poultry keepers in Maine, Minnesota, and even farther north in Canada, should be sufficient assurance that the house is the best one yet in actual use considering the many good features it contains. The writer lives on the summit of the Allegheny mountain range, and from practical experience with both the closed and open house, he has discarded all the houses of the closed type that it was impracticable to make into open front houses, and now uses them for other purposes. The birds are in far better health in open houses, the eggs hatch better, the chicks are stronger, the loses of layers are less, and a case of roup is, as yet, unknown in his flock. This is really a wonderful record considering the birds handled and raised yearly.

The widespread adoption of the open front house is almost entirely due to the vast circulation of this type of house by the Maine

Fig. 2. The Long Laying House at Cornell University, Ithaca, N. Y.

Agricultural Experiment Station in its bulletins and also bulletin No. 90 of the United States Bureau of Animal Industry. For the benefit of readers who contemplate the erection of a large building for the accommodation of 500 layers or over, this house has many features that will especially recommend it to them. The only objection I can see to this house is in the size of the pens. It is more profitable to keep the layers in smaller flocks than 100 in a pen, and for this reason I would suggest that the house be built not over 18 feet deep and the pens each 16 feet wide. This size pen will accommodate 50 layers, and the profit will be greater than in the 100 bird pens.

THE LATEST FORM OF CURTAIN-FRONT HOUSE

From bulletin No. 90, Bureau of Animal Industry:

The description is here given as it represents the latest development of this style of house (pl. 3.)

The house is 20 feet wide by 400 feet long, and is divided into 20 sections, each being 20 feet square. It is on the same general plan as houses Nos. 1 and 2, just described, but house No. 1 is 12 feet wide, house No. 2 16 feet wide, and this one 20 feet wide. The widths have been increased in the last two houses, as experience has shown the advisability of it. At first it was thought the houses should be narrow so that they might dry out readily, but the 20-foot house dries out satisfactorily, as the opening in the front is placed high up so that the sun shines in on the floor to the back in the shortest winter days.

The economy in the cost of the wide house over the narrow ones, when space is considered, is evident. The front and back walls in the narrow house cost about as much per lineal foot as those in the wide house, and the greatly increased floor space is secured by building in a strip of floor and roof running lengthwise of the building. The carrying capacity of a house 20 feet wide is 66 per cent greater than that of a house 12 feet wide, and is secured by merely building additional floor and roof. The walls, doors and windows remain the same as in the narrow house, except that the front wall is made a little higher. Three sills which are 6 inches square run lengthwise of the house, the central one supporting the floor timbers in the middle. They rest on a rough stone wall, high enough from the ground for dogs to go under the building to look for rats and skunks that might incline to make their homes there. The stone wall rests on the surface of the ground, and there are openings in it like cellar windows every 20 feet to allow the air to draw through and keep the basement dry during the summer. The floor timbers are 2 by 8 inches in size and rest wholly on top of the sills. All the wall studs rest on the sills; the front ones are 8 feet long and the back ones are 6 feet, 6 inches long. The two sides of the roof are unequal in width, the ridge being 8 feet from the front wall. The height of the ridge from the sill to the extreme top is

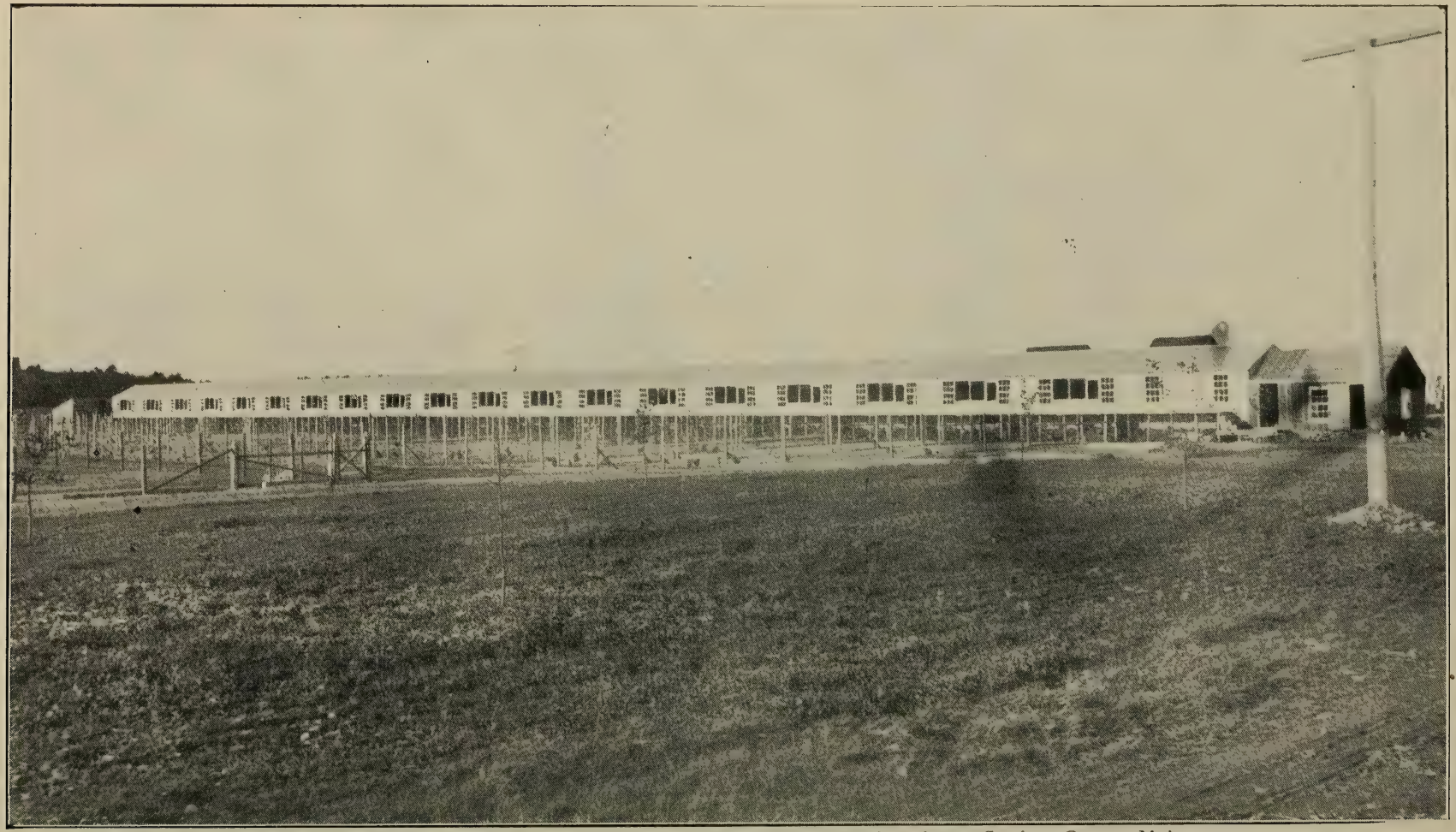


Fig. 3. The Latest Form of Curtain-Front House. At Maine Experiment Station, Orono, Maine.

12 feet, 6 inches. All studding is 2 by 4 inches in size and the rafters are 2 by 5 inches. The building is boarded with one inch boards, and is papered and shingled with good cedar shingles on walls and roof. The floor is of two thicknesses of hemlock boards which break joints in the laying.

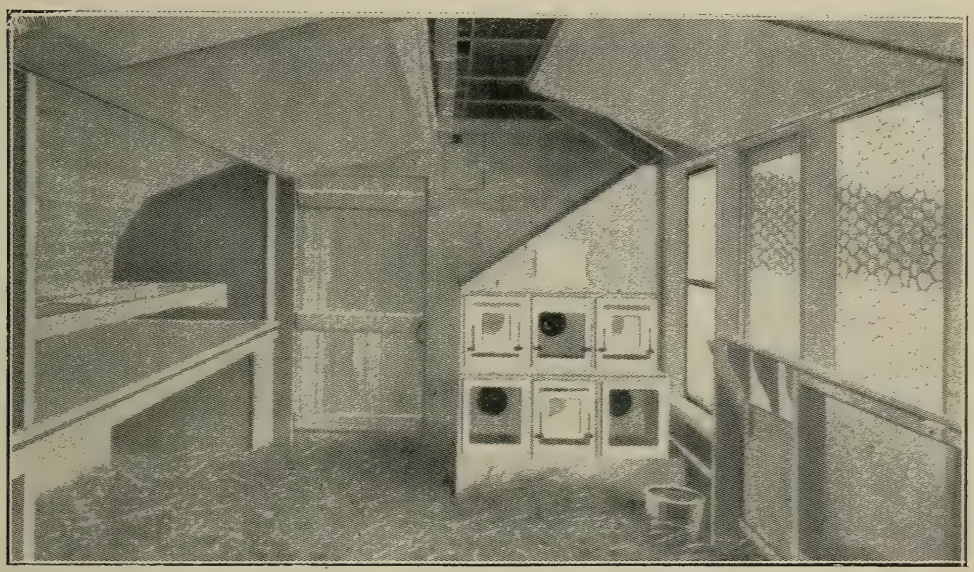
The building is divided by tight board partitions into twenty sections, each section being twenty feet long. All the sections are alike in construction and arrangement. The front side of each section has two storm windows of 12 lights of 10 by 12 inch glass. These windows are screwed on upright and 2 feet 8 inches from the end of the room; they are three feet above the floor. The distance between the windows is 8 feet 10 inches and the top part of it to a depth of 3 feet 6 inches from the plate is not boarded but is left open to be covered by the cloth curtain when necessary. This leaves a tight wall three feet ten inches high extending from the bottom of the opening down to the floor, which prevents the wind from blowing directly on the birds when they are on the floor. A door is made in this part of the front wall for the attendant to pass through when the curtain is open. A door 16 inches high by 18 inches wide is placed close to the floor under one of the windows for the birds to pass through to the yards in front. A similar door is in the center of the back wall to admit them to the rear yard when it is used.

A light frame made of 1 by 3 inch pine strips and 1 by 6 inch crossties is covered with 10-ounce white duck and hinged at the top of the front opening, which it covers when closed down. The curtain is easily turned up into the room, where it is caught and held by swinging hooks until released.

The roost platform is made tight and extends along the whole length of the room against the back wall. It is 4 feet 10 inches wide and 3 feet above the floor, being high enough for a person to get under it comfortably when necessary to catch or handle the birds. There are three roosts framed together in two 10-foot sections. The tops of the roosts are 1 foot above the platform and hinged to the back wall so they may be turned up out of the way when the platform is being cleaned. The back roost is 12 inches from the wall and the spaces between the next two are 16 inches. They are made of 2 by 3 inch spruce lumber placed on edge with the upper corners

rounded off. The roosting closet is shut off from the rest of the room by curtains similar to the one described above. For convenience in handling there are two of these curtains, each 10 feet long. They are 3 feet wide and are hinged at the top so as to be turned out and hooked up. The space above this curtain is ceiled and in it are two openings each 3 feet long and 6 inches wide for ventilating the roosting closet when necessary. In every compartment there is a door placed 5 inches out from the edge of the roost platform. These doors are three feet wide and seven feet high, divided in the middle lengthwise, and each half is hung with double-acting spring hinges allowing it to swing open both ways and close.

Ten nests are placed in two tiers against the partition in each end of the room. They are of ordinary form, each nesting space



Interior of Curtain Front Poultry House shown in Plate No. 3.

being 1 foot wide, 1 foot high and 1 foot long, with the entrances near the partition away from the light, and with hinged covers in front for the removal of eggs. Each section of five nests can be taken out without disturbing anything else, cleaned and returned. In constructing the house it was designed to use these nests only during the present year. The framework where they rest was arranged for the use of trap nests, the intention now being to install them in October of the present year.

Troughs similar to those described on page 24 are used for feeding dry mash, shell, bone, grit and charcoal.

Two lines of 4 by 4 inch spruce are arranged as an elevated track above the doors. The track extends the entire length of the building, and being faced with narrow steel bands on top, a suspended car is easily pushed along even when heavily loaded. The car platform is 2 by 8 feet in size, and is elevated a foot above the floor. All feed and water are carried through the building on this car. Ten iron baskets into which the accumulations on the roost platforms are cleaned every morning, are put on the car and collections are made as the car passes on through the pens to the end of the building, 400 feet away where the roost cleanings are dumped into the manure shed. As the car is pushed along a guard at the front end comes in contact with the doors and pushes them open, and they remain open until the car has passed on, when the spring hinges force them to close again. This car is a great saver of labor as it does away with nearly all carrying by the workmen. It has enabled one man to take good care of the 2,000 hens from November to March, except on Saturdays, when the litter has been removed and renewed by other men.

At one end of the building there is a temporary feed and water house, also used for dish washing and scalding, where the car remains when not in use.

There is a walk outside of the building extending along its entire front. It is 14 feet wide, made of 2-inch planking, and is elevated 2 feet above the floor of the building, which allows the doors below it, through which the birds pass to the front yards, to be opened and closed without interference. The door which opens out of each room through the curtain section is above the outside walk and necessitates stepping up or down when passing through, which is not a very serious objection, as the door is used but little in the daily work, but mostly in the weekly cleaning out and renewing of the floor litter. A guard of wire poultry netting 1 foot wide, along the outside of the walk prevents the bird from flying upon the walk.

BREEDING FOR EGGS

From early times man has bred and propagated forms of animal life that they might be of use to him in some economic manner, but the science of breeding, as we understand it, is of comparatively recent origin, and the greatest strides in propagating useful forms and varieties of animals may be traced to the period within the last 100 years, and even the greatest specialization has taken place within the last half century. Considering these facts it is not remarkable that the knowledge of authentic origin concerning the means of improvement of live stock breeding should be of rather meagre circulation. It is an interesting but unfortunate circumstance that what knowledge was obtained by the earliest investigators was not handed down to the later breeders in any satisfactory manner. This was due to the fact that each one was working practically alone and there was no standard for breeding the different animals, due to the lack of an efficient organization. Some of the far seeing breeders in certain localities, seeing that more rapid advance could be made by banding together, formed local societies which gathered and discussed the relative merits of the different and many times, individual specimens. These men, having no rules to guide them, were led along by observation and performance as their only guides. They were not long in discovering that certain individual animals had the power to transmit their desirable features to their offspring in greater certainty than certain other animals of the same identical breeding. It was natural that as they were looking for improvement, they should use these animals for breeders that produced the stock nearest approaching the desired object; whether milk, meat or size.

It is not necessary for us to follow up the long period of investigation and research that has given to us the laws of breeding. Prof. Brewer of Yale has formulated the laws of breeding which govern the improvement of live stock as follows:

1. Every animal must have two parents, and every animal resembles its parents and ancestors in most of its characteristics. There is a force or tendency to keep offspring like their parents, or descendants like their ancestors. This is called "the law of heredity" or "like produces like."

2. No two animals are alike or identical in all respects, hence offspring are never precisely like their ancestors. This is known as the "law of variation" and is the complement of the first law.

3. Vastly more animals are produced than are needed for breeding, hence those having or transmitting the highest aggregate of good points should be used to breed from. This is called "selection."

4. By training, environment and by selection in mating the form may be modified and the relative value of the various points or characters changed so as to better suit the uses or fancy of the breeder. This is called "breeding to points."

5. By continued breeding to points the characters may be increased beyond what they were in their ancestors. This is called the "law of improvement."

6. The more uniform the ancestry and character, and the more restricted in numbers, the more uniform and certain will the characters occur in the resulting descendants.

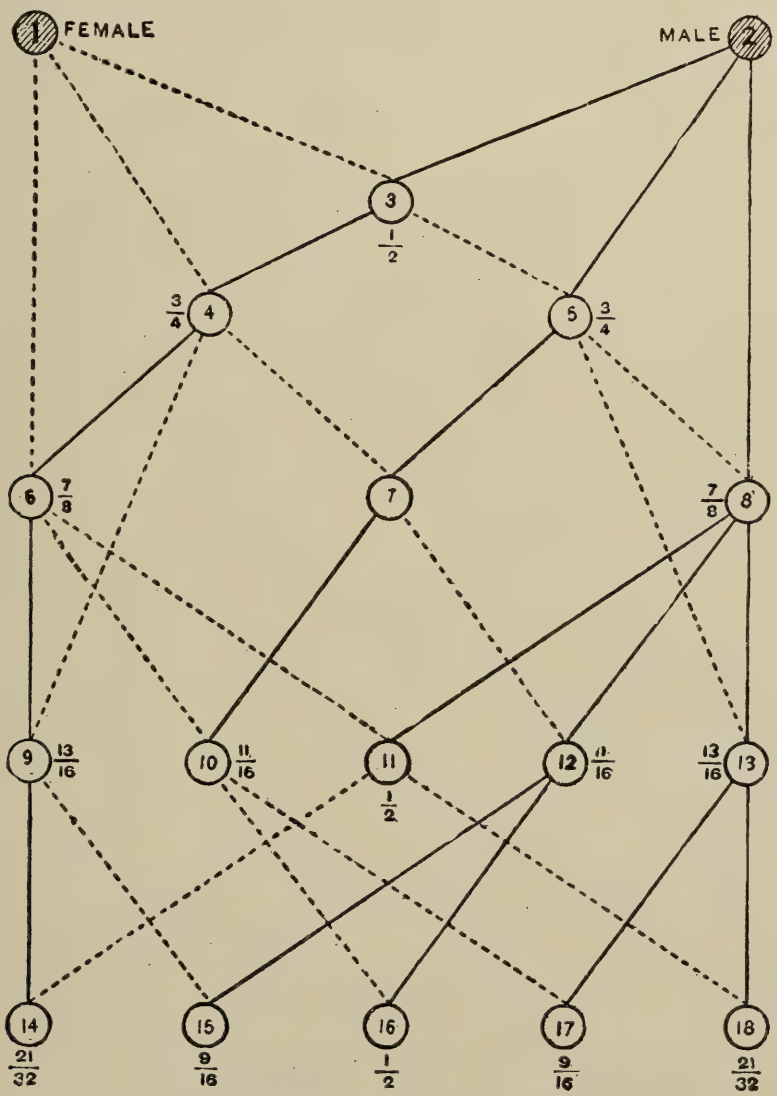
In the laws set forth above the breeder will find one that covers every phase of stock breeding, insofar as the actual operations of selection go. The two most important laws, if one can be of more importance than another, is the first law "like produces like" and the second law which is the converse of the first one "like produces unlike."

Considering our work of breeding for egg production these are the two laws that are of vital consequence. The breeder who studies this matter thoroughly will find very little authoritative and definite information concerning the matter of securing an increased egg production through the practice of breeding. It is the purpose of this book to shed the first definite light on the subject.

METHODS OF BREEDING

The methods of breeding most commonly applied to the production of live stock as designated by definite terms are as follows:

1. Line -breeding. This means the breeding of a strain of animals which contain the blood of one animal in excess, and is generally worked out along a prearranged plan. This is graphically shown and explained by the Felch Breeding Chart, as follows:



You may fail to see the meaning of the solid and dotted lines of the chart. To make it clear we say, each dotted line represents

the female as having been selected from the upper group, while the solid line shows the male as having been taken from the indicated upper group. Each circle represents the progeny. To wit: female No. 1 mated with male No. 2 have produced group No. 3 which is one-half the blood of sire and dam.

Females from group No. 3 mated back to their own sire No. 2, have produced group No. 5, which is three-fourths of the blood of the sire, No. 2, and one-fourth the blood of the dam, No. 1.

A male from group No. 3, mated back to his own dam, No. 1, produces group No. 4, which is three-fourths the blood of the dam, 1, and one-fourth the blood of the sire, No. 2.

Again we select a cockerel from group No. 5 and a pullet from group No. 4, of vice versa, which will produce group No. 7, which is mathematically half the blood of each of the original pair, No. 1 and No. 2. This is a second step toward producing a new strain.

Females from No. 5 mated back to the original male, No. 2, produce group No. 8, that are seven-eighths the blood of No. 2, and a cockerel from No. 4 mated back to the original dam, No. 1, produces group No. 6 that is seven-eighths of the blood of the original dam and only one-eighth the blood of the original sire.

Again we select a male from No. 8 and females from No. 6 and for a third time produce chicks (in group No. 11) that are half the blood of the original pair. This is the third step and the ninth mating in securing complete breeding of our new strain. In all this we have not broken the line of sires, for every one has come from a group in which the preponderance of blood was that of the original sire. Nos. 2, 8, 13 and 18 are virtually the blood of No. 2.

We have reached a point where we would establish a male line whose blood is virtually that of our original dam, and we now select from No. 6 a male which we mate with a female from No. 4 and produce group No. 9, which is 13-16 of the blood of the original dam, No. 1 and 3-16 of the blood of the original sire.

Again we select a male from No. 9 and a female of the new strain, No. 11, and produce group No. 14, which becomes 21-32 of the blood of the original dam, thus preserving her strain of blood.

A male from No. 13, which is 13-16 the blood of the original sire No. 2, mated to females from No. 10, which are 5-16 the blood of the original sire, No. 2, gives us group No. 17, which is 9-16 the blood of said sire.

While in No. 16 we have the new strain and in No. 18 the strain of our original sire, No. 2, we have three distinct strains, and by and with this systematic use we can go on breeding for all time to come. Remember that each dotted line is a female selection and each solid line the male selection.

Before going farther it may be said that this is the system used by the author in building up his heavy laying strain. A very prepotent (the ability to transmit in marked degree) hen formed the foundation of his line, and the flock was line-bred until her blood predominates throughout the flock.

2. Inbreeding. This is understood by the majority of breeders to mean the mating together of close relations, some authorities holding that it only means the mating of father and daughter, and brother and sister, while others claim that it takes in the relationship as distant as cousins. It is generally held to mean only the closest relationship mention.

3. Out-breeding. This means the introduction of males or females from a totally different strain.

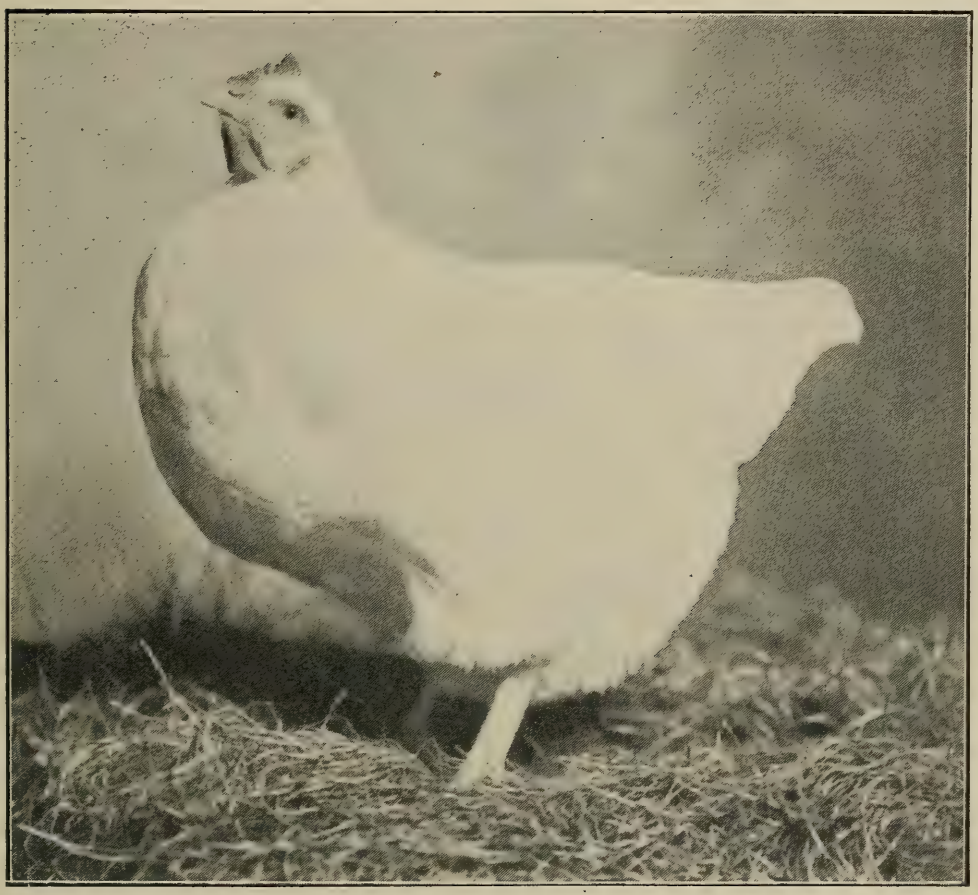
4. Cross-breeding. This means the breeding together of different varieties or different breeds of previously pure-bred animals.

APPLICATION OF THE LAWS

While practically all the other animals have been bred along some line of utility, the hen has been until the last few years, absolutely neglected in this respect. She has been bred for form and feather with the greatest success, but the economic value of her product has been sadly left alone. This is due beyond any doubt to the entire absence of accurate and reliable information as to any definite method of breeding or mating in order to make positive and certain advance. While the writer does not claim that an increase may be obtained every year, owing to the many contingencies which may effect the annual average increase, yet the results extending over an average of years should show a definite and appreciable increase. There are so many things that may seriously affect the results of one year, accidents and other unavoidable occurrences that the yield for any one or possibly more years will fall below the average of previous years. It will be recognized that as the limit of production is reached the increase will be correspondingly slower.

In my own work, the start of a heavy laying strain was made with a hen that laid 228 eggs in one year. She was bred to a very strong and vigorous cock bird, one year old. From this mating was raised, the first year, seventeen pullets. As I included fine feathers in my operations from the very start, anyone will recognize that the operations were highly specialized, and the birds available for breeders very limited in numbers. From these seventeen pullets but seven were put into the trap nest for testing—the others having been culled out. Out of the remaining seven, three laid 200 eggs or over in the 365 days forward from the day of first laying. The same cock bird was now bred to these three hens, and the best cockerel back to his mother—the 228 egg hen. Of the three hens mated to the cock bird, two produced 200 egg daughters, and the other produced stock with such light colored legs that she was discarded from all future breeding operations and all of her offspring likewise. From the old hen mated to her best son was produced one 200 egg hen, one 190 that was shown as a pullet, and one 192 also shown while making her record. It may be pertinent to note here that the best cockerel mentioned was twice a first prize winner,

both as young and an old bird, and the two hens last mentioned were in a second prize pen. The breeding operations now became too complicated to explain on paper, but they were worked out on the plan given in detail by the Felch breeding chart. A record of each individual chick has been kept for seven years, and it is my opinion, and this is certified by my experience that the matter of building up



WHITE PLYMOUTH ROCK, OWNED BY L. F. VAN ORSDALE
Egg record, 209 eggs in one year. Never shown. Dam of one pullet in second pen, Bradford, 1907. Score, 94¾.

a strain of superior layers must be worked out along this line, viz: individual pedigrees, trap nests in use all the year, testing only the best individual offspring of each particular breeder, and observing by all known means the transmitting powers of the individual male. This, I believe, is as important as it is to test the transmitting power of each separate hen.

HOW TO BUILD UP A HEAVY LAYING STRAIN

A large number of people have been led to believe that by simply testing a large number of hens and selecting the best layers for breeders they could build up a heavy laying strain, but let me say that if this was all that was necessary we would have had the 300 egg strain before now.

One of the experiment stations has pointed out that it can only lead to failure as it did in their case. After nine years of selective breeding from the best layers they discovered that the trend of egg production, instead of increasing, has been steadily downward. The only reason that can be assigned to this is because they have blindly followed the law of breeding that "like produces like," and have absolutely neglected any consideration of the stronger law that "like produces unlike." The experiment station in question now concludes that the only feature of merit about their past researches, in trying to build up a heavy laying strain by simply breeding from heavy layers, was its simplicity. They also call attention to the fact that various other kinds of animals have been bred for utility points with great success, but when it came down to chickens they ignored the same laws that have been applied to the breeding of other animals, and endeavored to make headway against the rejected experience of many practical breeders. They now assume that it is necessary to test the transmitting power of the individual, as has been done for so many years and with such success in the cases of horses, cattle, hogs and sheep. It has not been demonstrated that all fast horses produce fast horses. If it had we would all own fast ones. It has not been proven that all great milkers produce great milkers. If it had we would all be selling certified milk. If all prize winners at our poultry shows produced prize winners we would all have a front seat at Madison Square. Unfortunately the "if" will let us out, and in coming down to earth we realize that there is some other element that enters into the question, just what, we do not presume to say, but it is there, and in the same measure in this matter of egg production.

It should be borne in mind at all times that the more perfect we can make our matings in regard to the individual likes and dislikes of the pen mates, the more satisfactory will the hatching quality of the chicks be, as well as it affecting the quality of the offspring in other ways.. The way to keep a breed up to the proper size is

to use only parents that are themselves of the standard size. Never breed from a bird that ever had any disease; never breed from a bird that lays very small or badly shaped eggs, a crow-headed bird is never a good layer—a short, stout beak of the breed, a broad head, a full bright eye and a full deep chest are things to be sought when looking for a good layer. The same careful selection—only many times more careful—should be made of the male. Remember he is half the breeding pen and then some, and no amount of good selection among the females will amount to ought unless the same attention be given to the masculine member. Breed from a male that has a full clarion crow, a bright, snappy eye, kind and considerate of the females, yet strong and vigorous in his attention to the ladies. It is a very good plan to take the male away from the females an hour each day and allow him to fill up on all the grain you can induce him to eat. This will keep him in fine condition when the neglect may make a vast difference in the hatchability of the eggs at the time when they are most needed. It is a good plan to feed the males a chunk of fresh meat or some green cut bone daily during the breeding season.

"THE EGG TYPE"

Many of the readers of this book have seen advertised somebody's "system" for selecting layers at so much per copy. But I want to say that if anybody invents a system or could invent a system for selecting a good layer from a poor one, he would at once

ONE OF MR. VAN ORSDALE'S HEAVY LAYERS
Egg record, 211 eggs in one year. Pullet in first pen, Bradford, 1906. Score in competition, 93¾. Dam of pullet No. 336, score 94, third pen, Bradford, 1907. Dam of hen No. 337, 177 eggs. A great winter layer; laid in December, 1905, 25 eggs; in January, 1906, 28 eggs; in December, 1906, 27 eggs; in January, 1907, 20 eggs. Total in four months, 100 eggs.

spring into that infinitely small class of people to whom the world makes a beaten path—and this without spending hundreds of dollars in advertising. These so-called systems depend for their effectiveness on the development of the pelvic bones of the hen, and also upon the external features such as the comb, wattles, eyes, feathers and actions which all poultrymen are familiar with. It is true that a laying hen has a wider space between the pelvic bones than a non-layer, but as for this indicating the quantity of eggs any

hen will lay is preposterous. The only way this can be told with anything like accuracy is by the trap nest—this is the absolute guide to a hen's production.

The beginner in starting to work on a heavy laying strain must take into consideration some of the vital differences that exist between breeds. The breeds are such as Plymouth Rocks, Wyandottes and Leghorns. The varieties are (in Rocks) Barred, White, Buff, Columbian, Silver Penciled and Partridge. The strains are Smith's, Jones's, Brown's, etc. This represents the distinction between breeds, varieties and strains.

In considering the essential differences in breeds, the first one that is strikingly prominent is conformation. While it is very true that there is no absolute egg type in any breed, still there are certain points that tend to influence the productiveness as a breed. Among them may be mentioned the necessity for the hen to have sufficient body room or development, in order to allow space for the egg organs. This point is better emphasized perhaps in the Plymouth Rock than in any other breed. They have the long body, deep chest, wide between the legs, broad in back, and in fact are the true shape for securing the maximum number of eggs. This feature is also noticeable in the best laying types of White Leghorns. The one disadvantage of the Leghorn is their small size as a breed, and I have always contended that this small body was not a feature that recommended the Leghorn as an egg producer in cold climates. It seems natural that the hen having the larger body, and consequently the larger digestive tract could overcome the variations in extreme cold by drawing on the surplus body stores for the heat energy necessary to carry them over periods of zero weather, and at the same time maintain the supply of eggs. I have always noticed that the best laying hens in winter are those that carry a block of fat near the skin around the rear parts. I believe and practice the theory that in order to lay regularly in cold weather, it is absolutely necessary for the hen to have all that she will eat—and work for, and it is found that the hens carrying the block of fat as mentioned above are the ones that have laid 20 to 29 eggs a month during December, January and February. The White and other Leghorn breeders will at once dispute the theory advanced here but many Leghorn breeders have told me that when it gets so cold as to be 10 degrees below zero

their hens have at once shut off the egg yield, and every one knows that when a hen quits laying it is generally about two weeks before she is back at her normal gait.

Perhaps the most vital comparison that can be made in this matter of breed conformation in regard to egg production is the Wyandotte. This bird as bred for show points at the present is absolutely foreign to all that should make a good layer. The body is so short that the tail begins to raise where the neck leaves off, and

ONE OF MR. VAN ORSDALE'S HEAVY LAYERS

Egg record, 201 eggs in one year. First hen, Bradford, 1907. Score 95. A pullet in first pen, Bradford, 1906, score 94. Dam of second cockerel, Bradford, 1907, score 94¾. Dam of hen No. 723, 190 eggs, in third pen, Bradford, 1907, score 94. Dam of hen No. 724, 192 eggs, score 93½. Dam of pullet No. 725, first pullet, Bradford, 1907, score 95¾, and special for best White Rock in class—over 80 competing.

as a result there is not even enough room for the organs to do proper work in egg production. In endeavoring to accentuate the difference in shape between the Rock and the Wyandotte the latter breeders have gone to the utmost extreme and resultingly the breed is receiving a severe setback as a utility bird. And it must be remembered that the fundamental law underlying the popularity of any breed is its economic usefulness—or egg production. The world wide popu-

larity of any breed or variety does not depend upon its show points, size, color or condition, but upon the number of eggs it will lay in the hands of that increasingly large number of backyard breeders and fanciers who depend upon a few fowls for their supply of fresh eggs. Booms for a breed are not any indication that it will drive any other breed off the map of fancy fowls, because the horde of people who only keep a few birds want something that will produce a fowl somewhere near the color of the originals, and the boom breeds are not generally of this kind.

Much complaint has been made concerning this matter of improper utility standards, but in the poultry business as in politics, the rules for the game will be made by the breeders who are to be financially benefitted by the impractical standards, and consequently the small fish must come to them for the latest show stock—or be eaten alive, so to speak.

This thing will never be properly adjusted until the show bird winner must show an egg record that corresponds to her feathers, and have an equal or greater value in determining the winner than her fine feathers. That this can be done is attested by the winners the author has bred whose records have been 200 eggs per year and over, and male winners whose mothers had records even better. But it requires a vast amount of the most exacting labor, the continual trap nesting, individual pedigrees, and at the end of each year but a very, very few breeders truly fit to breed from. At the end of the fifth year after raising in the first year about fifty birds and increasing each year until the fifth year to about 300 birds, I had left for breeders but seventeen birds. It requires no small amount of determination to stick to the necessary culling, but the results now justify the labor, and the coming birds are more even and the egg records more satisfactory each succeeding year. It will pay anyone who undertakes to breed layers, or show birds, or both, to cull to three or four breeders each year for the first four or five years. This may seem like slow work but it is really the most rapid in the end.

A SUCCESSFUL BROODER HOUSE

In the fall of 1906 the writer built a new brooder house which is about as successful as one could desire. It was built after the plan of a like house erected in 1903 by the Storrs Experiment Station of Connecticut, and was designed by F. H. Stoneburn of the Station.

The house, Fig. 1 of the accompanying illustration, is 15 by 30 feet on the ground. On the north side is an alley way 4 feet wide. The rest of the house being used for the pens, six in number, each 5 feet by 11 feet.

A Successful Brooder House

It will be seen by the interior views, figures 2 and 3, that the vital feature of this house is the depressed alley way or elevated chick floor, the latter being 3½ feet above the former. "This arrangement secures several advantages. It enables the attendant to care for the brooders and feed the chickens without the constant stooping required when the brooders are operated on the floor in the usual manner. It also reduces the enclosed air space fully one-third, effecting a corresponding saving in the amount of heat required to maintain a given temperature. It also places the chicks nearer the ceiling—the warmest part of the room—thus giving them the benefit of all the available warmth. Repeated tests in the house under discussion showed that in cold weather the temperature at

the level of the chick floor is fourteen degrees higher than at the alley floor about 3½ feet lower. And finally, the amount of side wall exposed to the weather is reduced fully one-half, quite a consideration in wind swept positions. The disadvantage of the plan becomes evident when it is found necessary to enter the pens for any purpose. It is inconvenient because of the necessary climb into the pens and the confined space in which to do the work." It is only necessary to enter the pens to clean them out, and with a short handled shovel and a short handled broom this is not unnecessarily inconvenient. One has to stoop anyhow in working, and the roof is high enough so that it is not necessary to crouch down.

The selection of a site is an important matter. It is better to

Fig. 1. Brooder House.

do a little extra digging than to have the house an inconvenient distance from the other buildings. The alley way was formed by digging a trench along the north side. This should be deep enough to allow several inches of broken stone under the alley floor to provide drainage. Parallel stone walls four feet apart were then laid in this trench and carried to a height of 3½ feet. These were joined by a stone wall of the same height at the west end, the east end being left open for the doorway. When laying the wall on the south side of the alley provision was made for the three lamp pits, each 2½ by 5 feet, and 1 foot deep, as indicated on the plans. Each pit accommodates the lamps of two brooders.

"The rest of the foundation is a simple wall varying in height according to the slope of the land, but carried to the same level as the alley walls. Finally, the entire floor was cemented, including the bottoms of the lamp pits, the cement in the chick pens being at the level of the top of the foundation walls."

In the building built by the writer the entire frame is made of 2 by 4 stuff, including the sills, which are laid in cement. The walls are 3½ feet high. The roof is an even span, with a rise of 2 feet. The rafters are tied with collar beams which are spiked on a level 7½ feet from the alley floor. The entire frame was covered with No. 2 yellow pine matched flooring, the roof covered with a three-ply roofing paper, and the walls and ends covered with the same

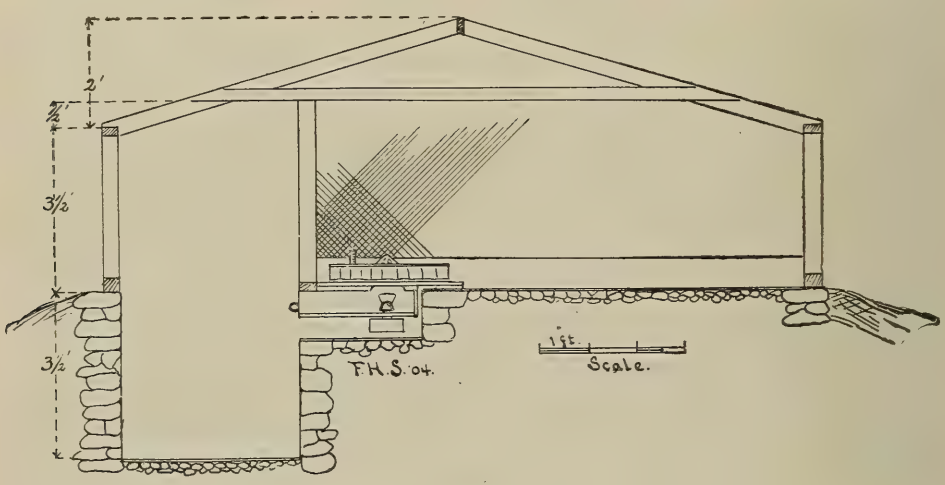


Fig. 2. Cross Section.

material. The door and window frames are laid over the paper. The structure is absolutely wind proof. Eaves troughs are required to carry away the surplus water which might make its way into the building.

The interior of the Storrs' building was covered with lath and asbestos paper, but my building is lined with Sackett plaster boards and only the cracks plastered. This was done to cut down the cost, and answers very well for the purpose. The plaster boards were laid across the collar beams which forms an attic of great value in controlling the temperature, preventing direct radiation through the roof. Large sliding ventilators, operated from the alley way by cords, are placed above each pair of chick pens, and in each gable doors are placed which open into the attic from outside. These

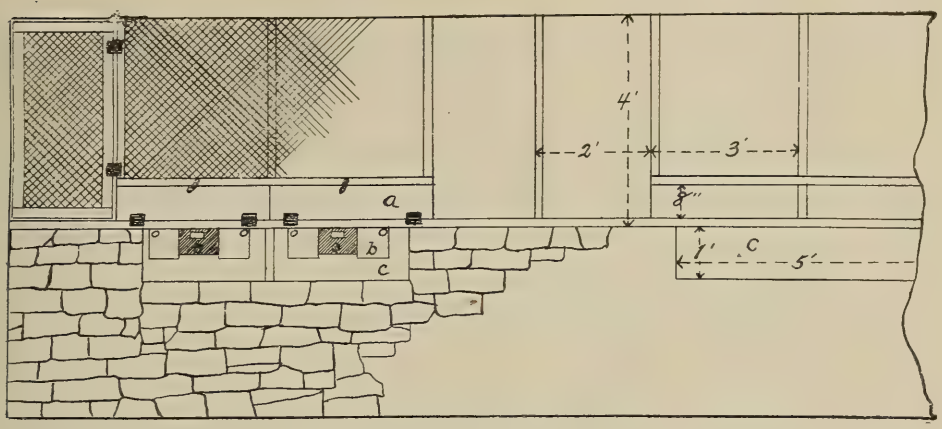


Fig. 3. Section showing south side of alley.

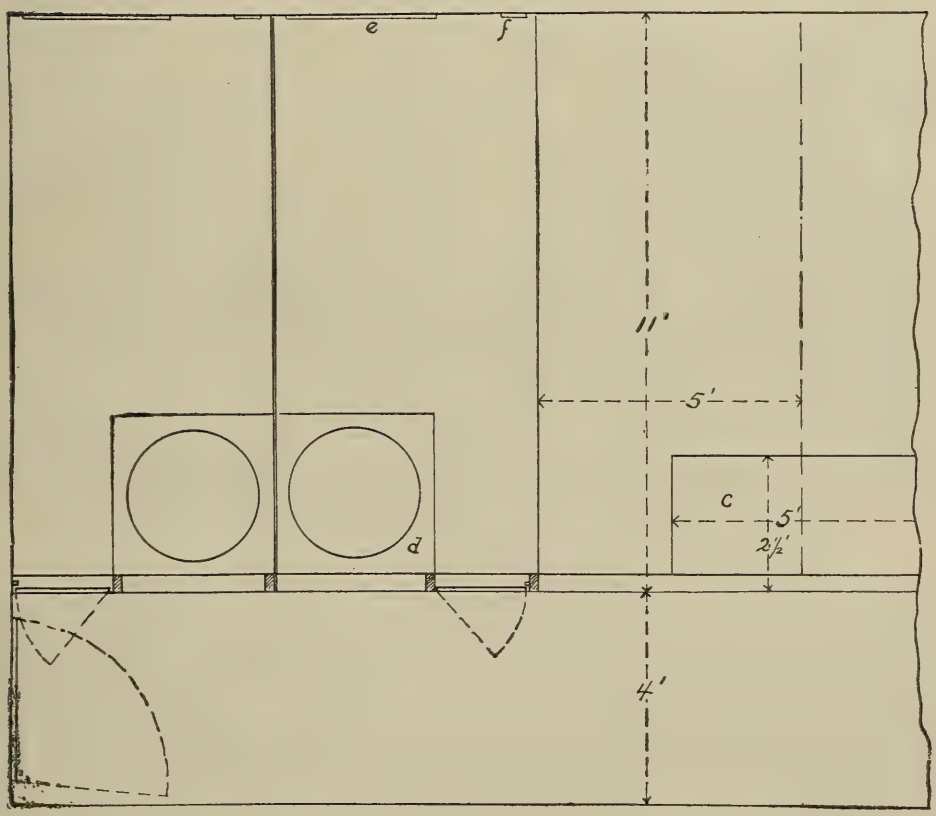


Fig. 4. Plan.

A.—Clean-out door, rear of brooder.
B.—Heater.
C.—Lamp pit.
D.—Brooder.
E.—Window.
F.—Chick door.

are regulated according to the weather and form a decidedly effective ventilating system which is entirely under control.

"In the south side are six windows (note fig. 1), one for each pen, each a single sash with six panes of 10 by 12 inch glass. These windows open inward, being hinged at the bottom, and are controlled from the alley by cords. At the west end of the alley another window of the same size is placed. This lights the alley thoroughly, which is very desirable, particularly on dark winter days. Chick doors (note fig. 4), are 6 by 7 inches in size and are

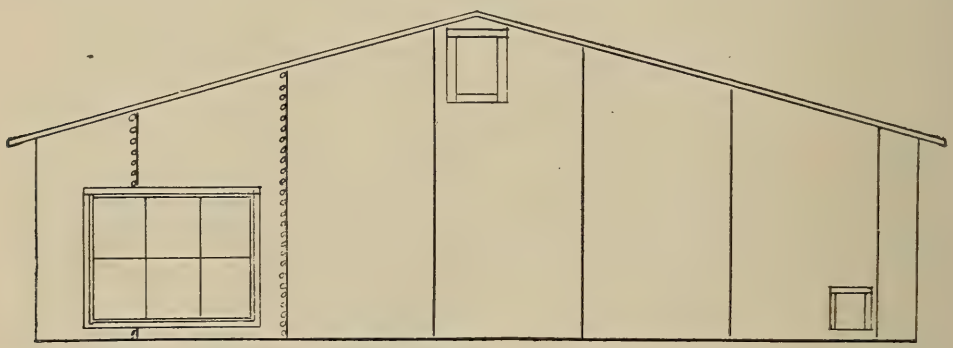


Fig. 5. West Elevation.

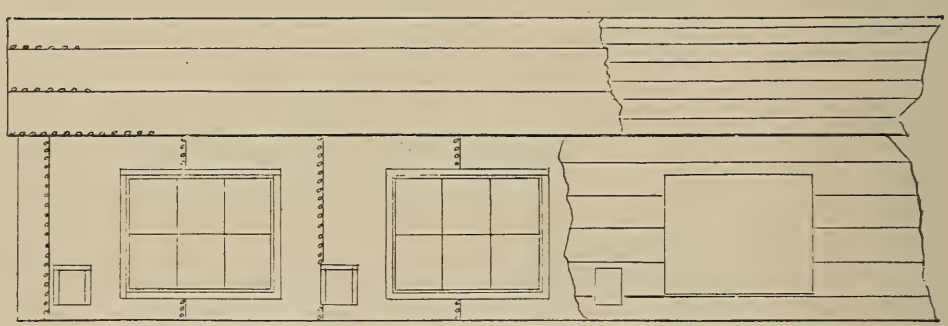


Fig. 6. South Elevation.

also operated by cords. The construction of pen partitions is so clearly explained by the cuts that no further explanation seems necessary. The door is made as wide as possible to permit the easy passage of wheelbarrows for cleaning."

The writer uses Prairie State Universal hovers, (note fig. 7,) which come complete; all that is necessary is to cut a round hole in the board floor over the lamp pits. Gas is used for fuel, each hover having an ordinary Welsbach light under it. In ordinary weather these six lights keep the building sufficiently warm, but

for winter use a small stove is placed in the corner at the west end. A very small blaze will keep the building sufficiently warm on the coldest winter days.

By having a north slope it would be possible to build this brooder house with very little digging, and an eastern slope would do away with steps down into the alley way. In the house I built it was necessary to dig the trench on the level, and then dig a drain to a lower point in order to have the alley way always dry. It is a great convenience to have the house so that the chicks can run

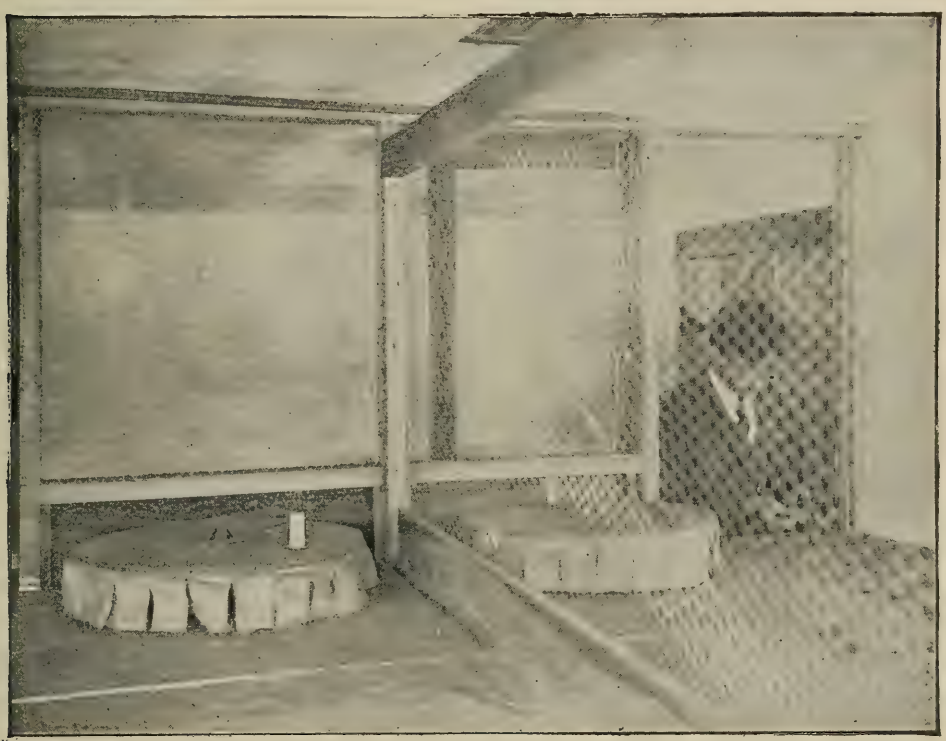


Fig. 7. Interior, showing two hovers.

right out onto the ground without having to climb an elevated runway.

The cost of such a building is not given by the Storrs bulletin, and in the writer's case no account of time was taken, the work all being done by himself at spare times. The stone was secured on the farm and were laid in cement. The total cost of material was in the neighborhood of $115.00. All that was hired was the

hauling of stone by a team two days. The hovers, hardware and labor are not included in the above figures.

It will be seen that this house which will carry 300 chicks until they are six weeks old, is much cheaper than to invest $100 in ten outdoor brooders. Considering the ease of operation and the consequent better care of the young chicks at the time when they most need it, this building is the cheapest investment a poultryman can make. The brooder house in winter can be used for carrying special breeding males until the pens are mated, when it is carefully swept all over inside, the pens washed out with strong disinfecting solutions, and the house three times fumigated with formaldehyde. This insures a perfectly clean and hygienic house for the new broods.

CONCLUSION

The fundamental success of any business depends upon the brains of one man in the beginning. It is no less true of the poultry business. It is an every day job—not skipping Sundays or legal holidays, and the man who engages in it must make the chickens the main factor and all others subservient or he will never make the greatest success. If one thing more than any other in this business means success or failure it is the ability to properly hatch and raise the next year's layers. This has caused the failure of more poultry plants than all the others combined. First begin with a trio or pen. When you have successfully raised 25, 50 or 100 chicks, then try 200, not 500. When the 200 are successfully raised try 300. By this time you will understand some of the essential features that are present in the effort to raise 300 that were not present in the raising of the 50 or the 100 lots. The beginner in an extensive business enterprise of any kind would not think of increasing his stock unless he knew something of the matter of increasing his plant and capital in proportion as his stock increases. Yet we see, on every side, people engaging in the poultry business who do not know the first thing of handling over 50 or 100 layers, and many times they start with a number of incubators and hundreds of chicks when their experience and capital are of the old hen size. It is not my intention to discourage anyone who contemplates going into the poultry business, as a business, but I do want to lay before them some of the vital elements that enter into the deepest part of the subject that they may not begin only to fail. There are many things to contend with—hundreds unknown to the amateur—and the surest way to success lies along the slow road. With all things working for the best every one will have bad "luck" and after a series of trials and tribulations—if the poultry fever still sticks—there is the making of a successful poultryman. I have told you the best I know. Try it.

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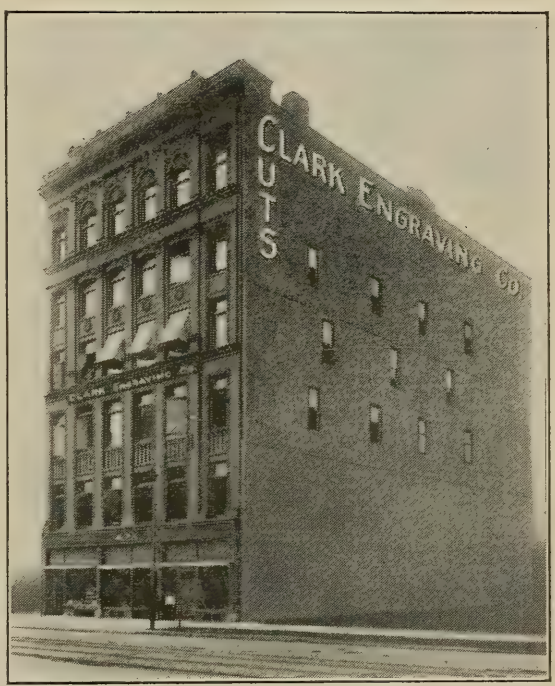

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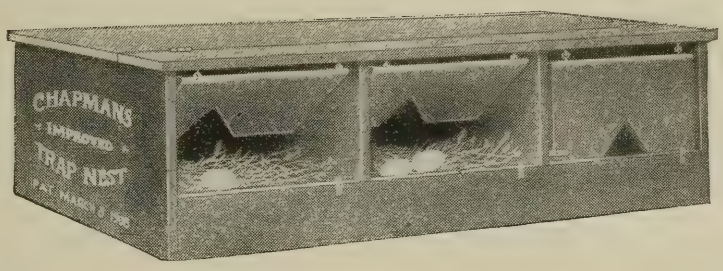

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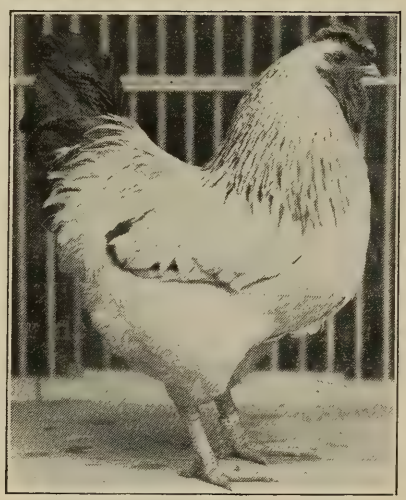

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